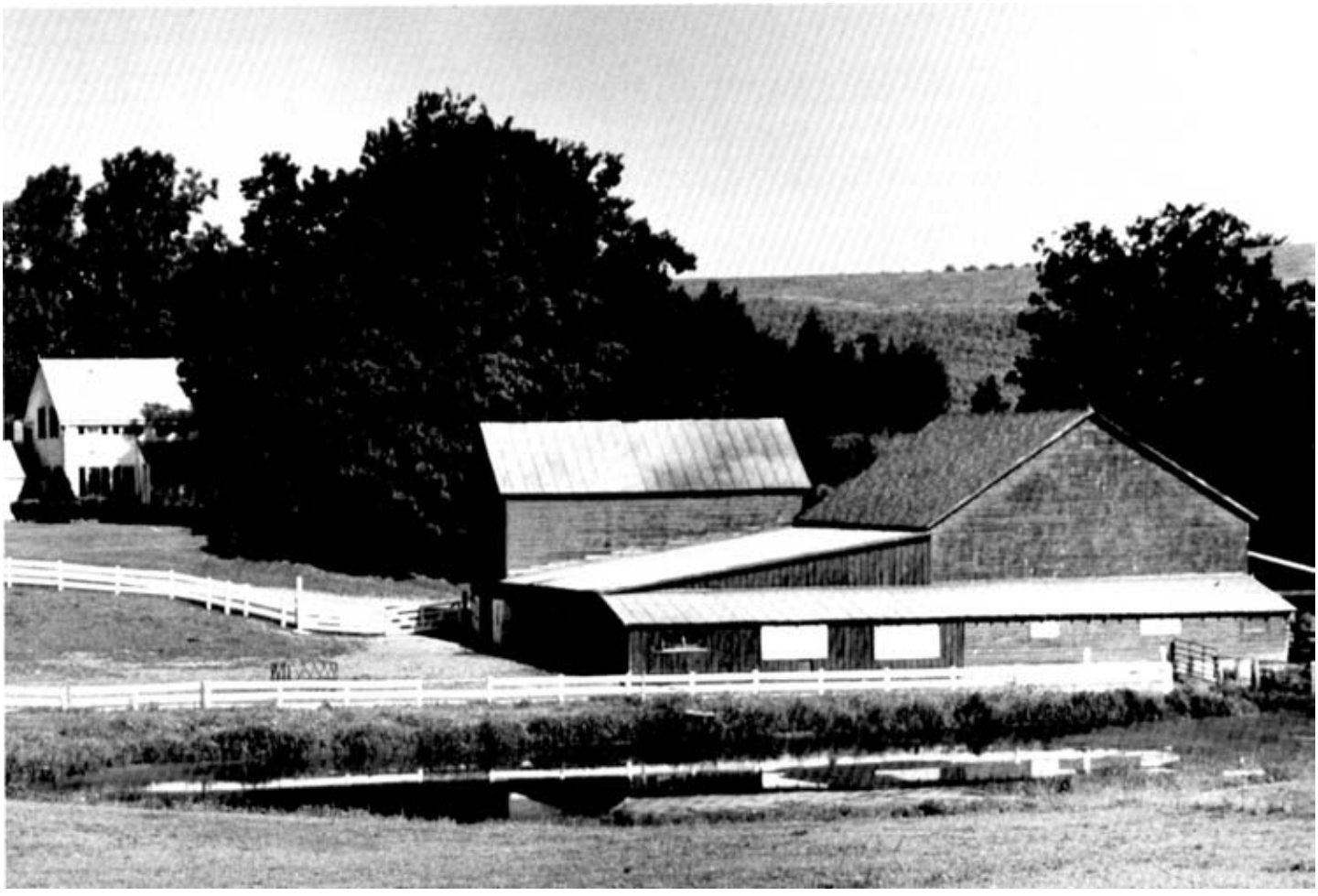
United States Department of Agriculture

Soil Conservation Service

In cooperation with Cornell University Agricultural Experiment Station

Soil Survey of Columbia County, New York



How To Use This Soil Survey

General Soil Map

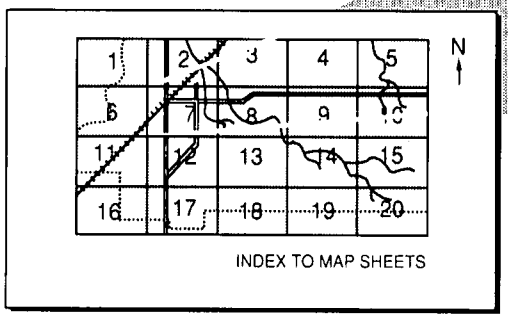
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

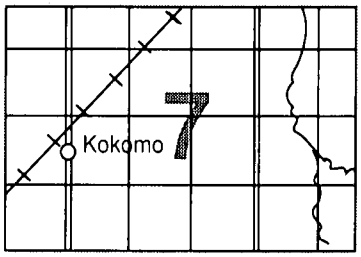
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

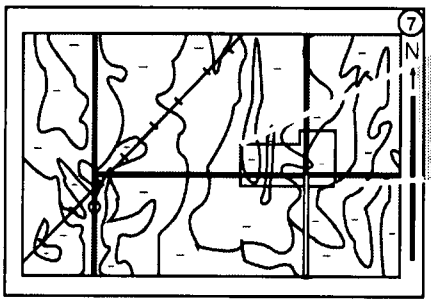


INDEX TO MAP SHEETS



MAP SHEET

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



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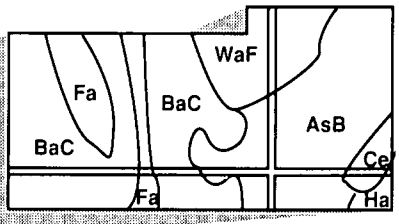

AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, handicap, or age.

An earlier soil survey of Columbia County was published by the United States Department of Agriculture in 1929 *(10)*. This survey updates the earlier one and provides additional information and maps that show the soils in greater detail.

Major fieldwork for this soil survey was completed in 1984. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This survey was made cooperatively by the Soil Conservation Service and the Cornell University Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Columbia County Soil and Water Conservation District. Partial funding for this survey was provided by the Columbia County Legislature through the Columbia County Soil and Water Conservation District. Additional funding was provided by the New York State Department of Agriculture and Markets.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: The farmstead and pasture in the foreground are on Blasdell soils. Stockbridge soils are on the ridges in the background.

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Issued June 1989

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Foreword

This soil survey contains information that can be used in land-planning programs in Columbia County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Paul Dodd
State Conservationist
Soil Conservation Service

Soil Survey of Columbia County, New York

By Roger J. Case, Soil Survey Party Leader, Soil Conservation Service

Fieldwork by Roger J. Case, Marjorie Faber, and Donna B. Tunkel, Soil Conservation Service; David Schwartz, Columbia County Soil and Water Conservation District; and Robert Landry, Contract, N.Y.S. Department of Agriculture and Markets

United States Department of Agriculture, Soil Conservation Service,
in cooperation with
the Cornell University Agricultural Experiment Station

COLUMBIA COUNTY is in the easternmost part of the mid-Hudson Valley in New York State (fig. 1). It covers 411,520 acres, or 643 square miles. The county has a population of 59,500. Hudson, its one city and the county seat, is the oldest incorporated city in New York State and has a population of 8,000.

General Nature of the County

This section describes some of the natural and cultural factors that affect land use in the county.

Farming, Soil Resources, and Transportation

In 1974 slightly more than a third of the land in the county was in active farms. Of that, 63 percent, or 97,121 acres, was in cropland. The rest was in pasture, woodland, and other uses *(5)*.

The most extensive type of farming in the county is dairy farming. Orchards are the second most extensive. Some other farms are used for raising beef cattle, horses, vegetables, truck crops, and poultry *(3)*.

A total of 58 percent of the county is woodland, including woodland on farms. The largest wooded areas are in the eastern part of the county. The Taconic Mountains in the survey area are almost completely woodland. Forest-related enterprises make up the fourth largest industry in the county.

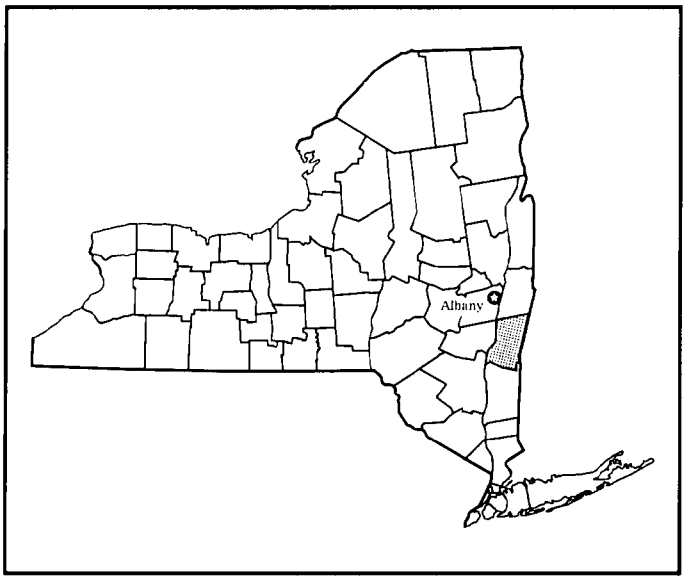

Figure 1.—Location of Columbia County in New York.

Most of the dairy farms in the county are on the high lime till soils of the Harlem Valley in the central and southeast parts of the county. Extensive areas of corn and hay support the 35,000 dairy cows and calves in the county.

Orchards are on the well drained outwash soils in the northwest part of the county around the village of

Kinderhook. The Hudson River provides a moderating "lake effect" on temperatures along the river, and apple orchards and other fruit orchards are on the gravelly terrace beaches and outwash plains that parallel the river.

A major area of shale bedrock-controlled till runs north-south through the center of the county. The soils in this area are on complex slopes. Bedrock in this area is between the surface and a depth of 40 inches, and the reaction of the soil is strongly acid and very strongly acid. Drainage patterns follow the natural north-south oriented folds in the bedrock. Most of the soils in this area that are used for farming are in hay or pasture; the soils are too shallow and too droughty for corn in most years.

Immediately adjacent to the Hudson River and extending north-south the entire length of the county is a major area of dissected lacustrine clay. The farmed parts of this area are mostly used for hay. In the few areas used for corn, planting is usually delayed because the soils are wet in the spring. A topographic view of the area shows dramatic erosion cutting from the shore of the river east into the county.

The major transportation routes in the county are the Hudson River, the New York State Thruway, the Massachusetts Turnpike, the Taconic State Parkway, and rail lines to all points in New York and New England. Most dairy products are shipped to metropolitan areas in downstate New York and in New England. The fruit orchards supply fresh fruit markets and commercial processors.

Physiography and Geology

Columbia County is in two major physiographic units. Most of the county is in the Hudson-Mohawk Valley. The easternmost part of the county is in the New England Upland *(15)*.

The Hudson-Mohawk Valley covers the area between the northern and southern boundaries of the county and between the Hudson River and the Taconic Mountains east of New York State Route 22. The Taconic Mountains east to the Massachusetts state line are in the New England Upland.

The Hudson-Mohawk Valley has two major subsections. One is deep, dissected lacustrine sediments immediately adjacent to the Hudson River and extending the length of the county. At the eastern margin of this lacustrine plain, a strand of glaciolacustrine sand and gravel beach ridge is transitional to the second subsection, which is glacial till upland.

The central part of the county is underlain by folded shale bedrock. Glacial till deposits are generally thin on the north-south oriented ridgetops of this folded shale, and the natural drainage of the area is north and south following the troughs made by the folds in the rock.

The Taconic Mountains are the westernmost part of the New England Upland and form the eastern border of the county. The Taconics are mainly metamorphosed schist, phyllite, and slate. The abrupt change in relief and elevation represented by the Taconic Mountains is the result of the Taconic orogeny, which caused folding and faulting of the sedimentary rocks to the extent that in many places the stratified bedrock is nearly vertical.

The elevation of the county ranges from sea level at the Hudson River to slightly more than 2,050 feet above sea level at the Massachusetts state line atop the Taconic Mountains in the town of Copake. Changes in elevation are not as abrupt in the Hudson-Mohawk Valley. In the lacustrine sediments adjacent to the Hudson River, the relief of the lake plain is fairly uniform, ranging in elevation from 100 to 250 feet, except in the city of Hudson and the towns of Stockport and Stuyvesant, where deep dendritic erosion has occurred. The elevation at the bottom of some of these dissections is only 40 feet above sea level. In the bedrock-controlled glacial till and deep glacial till regions in the central and eastern portions of the county, elevation changes are most abrupt, especially where there are many bedrock outcrops. The areas of deep till tend to be north-south oriented and resemble drumlins. The elevation between the lake plain and the Taconic Mountains ranges from 400 to about 1,000 feet.

Columbia County is underlain by bedrock mainly of the Ordovician and Cambrian periods (see the map at the back of this survey). The only notable exception is the large Becraft limestone formation just south of Hudson, which is from the Devonian period. Of the various formations of folded Ordovician and Cambrian rock, the Walloomsac Normanskill group is the most common in the county. The Nassau formation is the second most common bedrock, and the Stockbridge-Limestone group ranks third. Bedrock from the Rensselaer Graywacke and Schodack formations are the least common.

The oldest bedrock formation is the Nassau formation in the northwest quadrant of the county. It is mainly folded beds of slate, shale, and thin interbeds of quartzite. The Cambrian and lower Ordovician sediments from which these soils formed are more than 35 million years old.

The next oldest formation is the Stockbridge-Limestone group mainly in the southeastern quadrant in

the Harlem Valley and in a small component in a north-south band near New Lebanon. It is mainly calcitic and dolomitic limestone. The lower Ordovician sediments from which these rocks formed were deposited 30 million to 35 million years ago.

The Walloomsac-Normanskill formation, the most common type of bedrock in the county, is also the youngest of the commonly occurring types of bedrock. It makes up a large portion of the central, southwest, and eastern bedrock of the county, including that in the Taconic Mountains.

A small area of Rensselaer Graywacke extends into the northern areas of the county near North Chatham.

The Becraft formation is an isolated outcrop of Devonian limestone bedrock just south of the city of Hudson. The extent of the formation is no more than 4 miles long (north-south axis) and 1.5 miles wide. The Becraft formation is fossiliferous limestone.

The bedrock throughout the county is folded or tilted. Some areas are so intensely folded that the strata are vertical or even overturned. The thicker bedded limestone of the Stockbridge formation is generally less folded and outcrops in large tilted blocks. The Becraft formation is the only formation which has nearly level bedded rock strata.

Columbia County was covered and uncovered by several advances and retreats of glacial ice. This ice age began approximately 300,000 years ago and finally ended about 10,000 years ago. With each southern advance, the ice picked up soil material and pieces of bedrock and mixed and deposited these materials when it receded.

The result of this deposition of materials by the glacial ice is a soil forming material known as glacial till. Till is a heterogeneous mixture of particles carried and deposited directly by the glacier. Stockbridge and Bernardston soils, for example, formed in glacial till. Glacial till is the most common parent material of the soils in the county.

Glacial Lake Albany once occupied an area parallel to the existing Hudson River shoreline and extending the entire length of the county as far inland as the 200- to 250-foot contour. The sediments deposited in the lake formed glacial lacustrine deposits. Hudson, Rhinebeck, and Collamer soils, for example, formed in these fine lacustrine sediments.

Running water from the margins of the receding glacier carried sorted sediments and rock fragments. The velocity of the water determined the size of the sediments and the distance from the glacier before they were deposited. These water-sorted deposits are glacial outwash. Hoosic and Knickerbocker soils formed in glacial outwash.

Flooding along streams throughout the county deposits sediment on the flood plains. Occum, Linlithgo, and Limerick soils formed in these alluvial deposits.

Drainage

Most of Columbia County is in the Hudson River drainage basin. The Wyomanock, Kinderhook, and Stockport Creeks and their tributaries drain the northern part of the county. Claverack Creek and Taghkanic Creek, which also enter the Hudson by way of Stockport Creek, drain the central part of the county. The Roeliff Jansen Kill drains the entire southern part of the county. A small area in the central part of eastern Columbia County is drained east into the Housatonic River by way of the Green River.

The Stockport Creek and the Roeliff Jansen Kill are the only two main streams which outlet the various drainage areas of the county into the Hudson River. The outlets of both are deep into shale bedrock. The tides which affect the level of the river also determine the volume and velocity of the flow at the mouth of the streams.

Most of the streams in the county are of fairly low gradient. The Bash Bish Creek, coming out of the Taconic Mountains, creates a dramatic waterfall at the Massachusetts state line. The Wyomanock Creek and Claverack Creek and the Roeliff Jansen Kill have the broadest, most defined flood plains. Small streams and drainageways in the lacustrine plain adjacent to the Hudson River have developed classic dendritic drainage patterns.

Water Supply

Ground water and surface water are the two sources for domestic, municipal, agricultural, industrial, and commercial uses, as well as for recreation and fish and wildlife.

The largest source of surface water in the county is the Hudson River, which forms the western boundary of the county. However, the State Health Department has restricted its use. The city of Hudson obtains water from reservoirs impounded behind dams on smaller streams. Most communities tap ground water aquifers with deep wells. The outwash terraces in Kinderhook and Claverack are notable examples. Private wells serve most homes in rural areas.

Most major valleys that cross the county through the

lake plain generally contain thick deposits of sand and gravel that are excellent sources of ground water *(6)*. The other major source of ground water is in the fractures of bedrock. Wells in the bedrock generally yield adequate supplies for residential use.

In general, the quality of surface and ground water is good. Occasionally, the surface water supply is exposed to contamination, but contamination is not a major problem in the county. Hardness of the ground water, depending on the aquifer, is a nuisance in some areas, while in other areas the water contains iron.

Specialty crops, such as strawberries, grapes, sweet corn, and potatoes, require vast amounts of water for irrigation, often at critical times during the growing season. Many farmers build ponds for irrigation; others pump water from the nearest stream. The availability of water for irrigation will in some instances determine the suitability of a field for a particular crop.

Climate

Winters in Columbia County are cold, and summers are moderately warm with occasional hot spells. The mountains are markedly cooler than the main farming areas in the lowlands. Precipitation is well distributed throughout the year and is nearly always adequate for all crops. Winter snows occur frequently, occasionally as blizzards, and cover the ground much of the time.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Hudson in the period 1957 to 1981. Table 2 shows probable dates of the first freeze in fall and last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 26 degrees Fahrenheit, and the average daily minimum temperature is 16 degrees. The lowest temperature on record, which occurred at Hudson on January 22, 1961, is -24 degrees. In summer the average temperature is 70 degrees, and the average daily maximum temperature is 83 degrees. The highest recorded temperature, which occurred at Hudson on July 3, 1966, is 103 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 21 inches. Of this, 11.5 inches, or 55 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 16 inches. The heaviest one-day rainfall during the period of record was 5.25 inches at Hudson on August 28, 1971. Thunderstorms occur on about 27 days each year, and most occur in the summer.

Average seasonal snowfall is 42 inches. The greatest snow depth at any one time during the period of record was 29 inches. On an average of 45 days, at least one inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in the midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 60 percent of the time possible in the summer and 40 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in the spring.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil (fig. 2). The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material has few or no roots or other living organisms and has been changed very little by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between

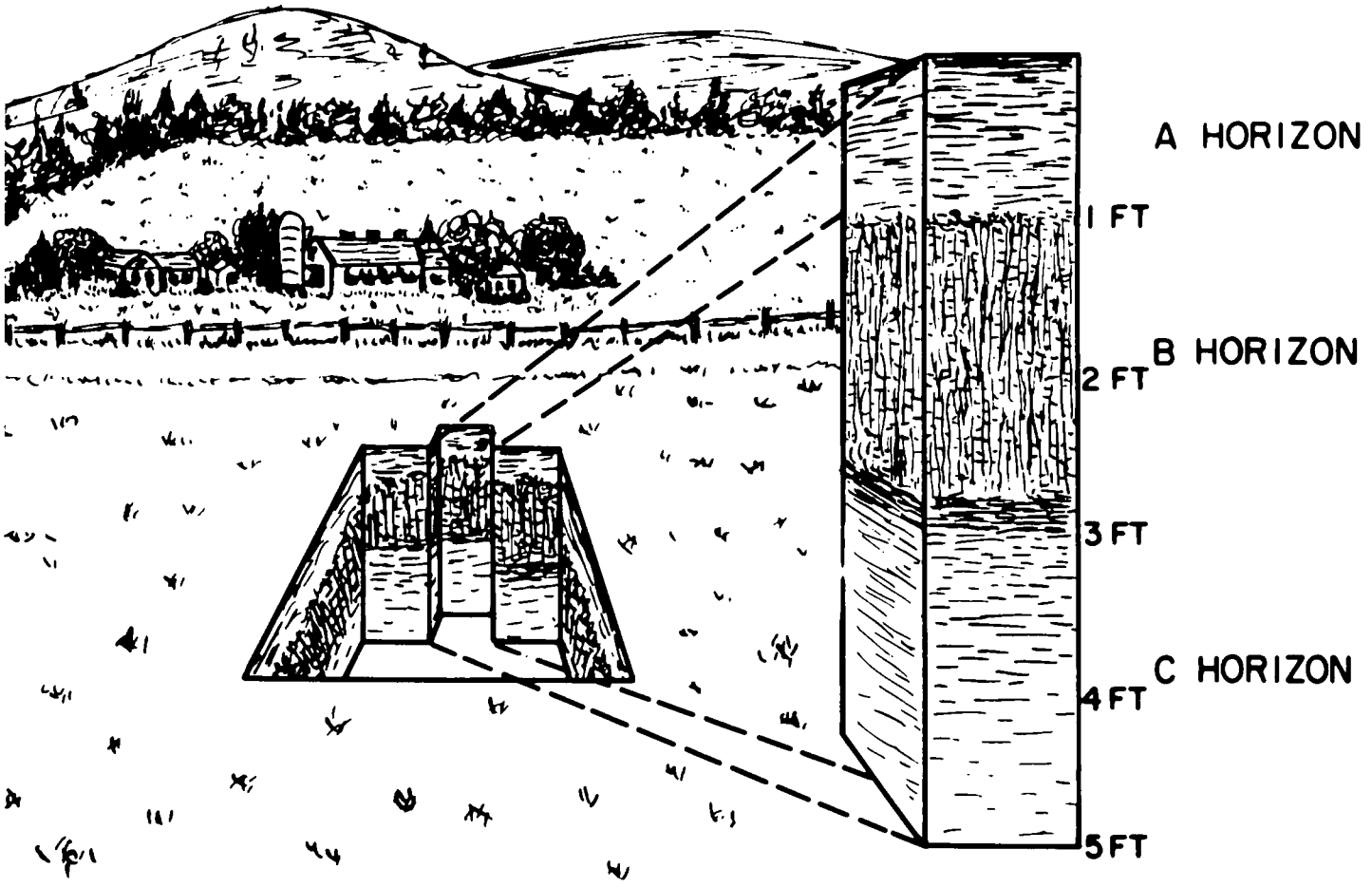

Figure 2.—Diagram of the horizons in a soil profile.

the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils

in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

In some areas along the borders of Columbia County, the names of the general soil map units do not match those of adjoining counties. These discrepancies exist because of differences in the detail of mapping, changes in soil classification, and differences in the proportions of the same soil in adjoining counties. In those areas the units in the adjoining counties contain similar kinds of soils.

Soil Descriptions

1. Hudson-Vergennes-Raynham

Dominantly nearly level to steep, very deep, moderately well drained to poorly drained, moderately fine textured to very fine textured soils; on lowlands and dissected lake plains

This unit consists of soils that formed in glaciolacustrine deposits with a large amount of silt and clay. The landscape is generally nearly level or gently sloping and is dissected by deep drainageways from the main north-south terrace adjacent to the Hudson River. Slopes are dominantly 0 to 15 percent but are as much as 35 percent in some dissected areas.

This unit covers about 11 percent of the county. Hudson soils make up about 16 percent of the unit, Vergennes soils about 13 percent, Raynham soils about 10 percent, and soils of minor extent about 61 percent.

The Hudson soils are moderately well drained and have a surface layer of silt loam. The subsoil and substratum are fine textured throughout. The rate of water movement through the subsoil and substratum is slow or very slow. The seasonal high water table is between depths of 18 and 24 inches in the spring. The Hudson soils are nearly level to steep. They are mostly on broad, irregularly shaped lowlands. The steep areas are generally on the side slopes of drainageways.

The Vergennes soils are moderately well drained and have a surface layer of silty clay loam. The subsoil and the substratum are clay. The rate of water movement through the subsoil and the substratum is slow or very slow. The seasonal high water table is between depths of 12 and 36 inches in the spring. The Vergennes soils are nearly level to steep. They are mostly on broad, irregularly shaped lowlands. The steep areas are generally on the side slopes of drainageways.

The Raynham soils are poorly drained and have a surface layer mainly of silt loam. The subsoil and substratum are silt loam or very fine sandy loam. Water movement in the subsoil and substratum is moderately slow or slow. The seasonal high water table is at or near the surface in the spring. The soils are nearly level and are in broad, round or oval areas on lowlands.

Of minor extent are Rhinebeck, Collamer, Unadilla, Scio, Kingsbury, Niagara, Canandaigua, Madalin, Birdsall, and Livingston soils. Poorly drained and very poorly drained Canandaigua soils and very poorly drained Madalin, Livingston, and Birdsall soils are in drainageways and slightly concave or ponded areas. Moderately well drained Collamer and Scio soils are in transitional areas to sandier outwash areas. Niagara, Rhinebeck, and Kingsbury soils are somewhat poorly drained and are throughout the unit.

Most areas of this unit are used for hay or pasture,

and a few areas are used for corn. The steep areas are brushland or woodland and are actively eroding. All the soils in this unit are highly erodible and require contour tillage, minimum tillage, careful crop rotations, and maintenance of permanent sod or pasture. Most areas used for farming need drainage.

Slow permeability, a seasonal high water table, clayey texture, slope, erodibility, and frost action are the main limitations of the unit for community development.

Some areas of this unit are managed woodland. In some areas firewood is harvested. Timber harvesting causes erosion, especially on steep slopes. Access roads and log skid trails built across the slope will reduce erosion.

2. Blasdell-Hoosic-Knickerbocker

Dominantly nearly level to steep, somewhat excessively drained and well drained, medium textured to coarse textured soils; on outwash plains, terraces, kames, and eskers

This unit consists of soils that formed in glacial outwash along the large tributary valleys of the Hudson River. Slopes range from 0 to 35 percent.

These soils cover about 15 percent of the county. Blasdell soils make up about 40 percent of the unit, Hoosic soils about 25 percent, Knickerbocker soils about 15 percent, and minor soils about 20 percent.

The Blasdell soils are well drained and loamy and gravelly. They formed in water-sorted material derived mainly from shale. Permeability in the Blasdell soils is moderately rapid, and slopes range from 0 to 35 percent.

The Hoosic soils are somewhat excessively drained and sandy and gravelly. They formed in water-sorted materials derived mainly from shale and quartzite. Permeability in the Hoosic soils is moderately rapid to very rapid, and slopes range from 0 to 35 percent.

The Knickerbocker soils are somewhat excessively drained and sandy. They formed in water-sorted material. Permeability in the Knickerbocker soils is rapid, and slopes range from 0 to 35 percent.

Of minor extent are moderately well drained Castile soils and somewhat poorly drained and poorly drained Walpole soils in slightly concave areas and somewhat poorly drained to poorly drained Fredon soils and very poorly drained Halsey soils in drainageways and wet spots.

Most areas of these soils are used for corn, hay, vegetable crops, and fruit. The steeper areas are pasture or wooded. These soils are easy to work, but the productivity is sometimes limited by droughtiness. Irrigation improves productivity on the less sloping soils of this unit. The hazard of erosion increases as the slope increases. Farming on the contour, stripcropping, and using cover crops are effective management practices on the steeper areas. Where the slopes are short and complex and contour measures are not practical, crop residue in and on the soil and conservation tillage help to reduce erosion. Gravel and surface stones interfere with the operation of some types of farm machinery.

On slopes of less than 8 percent these soils are generally suitable as sites for dwellings. Very rapid permeability causes a hazard of ground-water pollution from septic tank absorption fields. Some areas of this unit are mined for sand and gravel.

3. Stockbridge-Georgia

Dominantly nearly level to moderately steep, very deep, well drained and moderately well drained, medium textured soils; on uplands

This unit consists of soils that formed in glacial till with a moderate to large content of lime derived from local limestone bedrock. Slopes range from 0 to 35 percent. The dominant slope range is 8 to 25 percent.

This unit covers about 16 percent of the county. Stockbridge soils make up 49 percent of the unit, Georgia soils about 13 percent, and minor soils about 38 percent (fig. 3).

The Stockbridge soils are well drained. The rate of water movement in the surface layer and subsoil is moderate. It is moderately slow to slow in the substratum.

The Georgia soils are moderately well drained. The rate of water movement in the surface layer and subsoil is moderate. It is moderately slow to slow in the substratum. The seasonal high water table is at a depth of 18 to 36 inches from November to May.

Of minor extent are Massena, Sun, Farmington, Nassau, Manlius, Occum, and Linlithgo soils. Somewhat poorly drained and poorly drained Massena soils and poorly drained and very poorly drained Sun soils are in concave positions on the landscape or in drainageways that cut through uplands or receive runoff from surrounding uplands. Farmington soils, common in the southeastern part of the county, are shallow to hard limestone bedrock. Nassau and Manlius soils are on adjacent landscapes. The Nassau soils are shallow, and the Manlius soils are moderately deep to shale. Well drained Occum and somewhat poorly drained Linlithgo soils are on flood plains.

Most areas of this unit are used for farmland, mainly

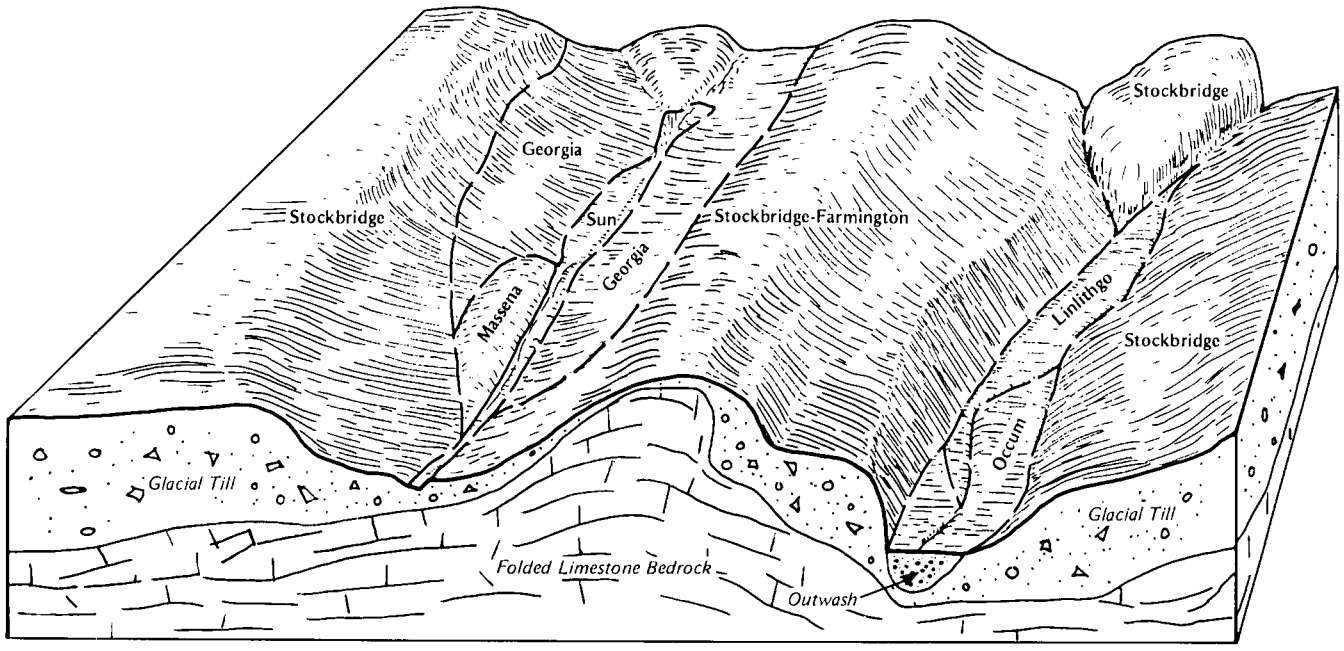

Figure 3.—Typical pattern of soils and underlying material in the Stockbridge-Georgia general soil map unit.

pasture, hay, row crops, orchards, and vineyards. A few areas are brushland or wooded. Stripcropping and a system of crop rotations help to reduce erosion. Included wet spots are usually drained by the use of tile. The suitability for vineyards is generally restricted to the more sloping landscapes.

Slow percolation rates and slope are the main limitations for community development. Protecting construction sites with a plant cover or mulch helps to prevent erosion and sedimentation.

4. Pittstown-Bernardston

Dominantly strongly sloping and moderately steep, very deep, moderately well drained and well drained, medium textured soils that have a dense substratum; on uplands

This unit consists of soils that formed in glacial till with a large content of shale and phyllite. The slope range is mainly 8 to 25 percent, but a few areas of Bernardston soils have slopes of up to 35 percent.

The unit covers 6 percent of the county. Pittstown soils make up 40 percent of the unit, Bernardston soils 30 percent, and soils of minor extent 30 percent (fig. 4).

The Pittstown soils are moderately well drained. They have a firm or very firm, dense substratum at a depth of 15 to 25 inches that restricts root growth. The seasonal high water table is perched above the dense substratum from November to April. Permeability is moderate in the surface layer and subsoil and slow in the substratum. The Pittstown soils are gently sloping or moderately steep on hillsides and often receive runoff from surrounding uplands.

The Bernardston soils are well drained. They have a firm substratum generally at a depth of 15 to 30 inches, but it is closer to the surface on some steep, eroded slopes. The substratum restricts root growth and causes a perched water table. The permeability is moderate in the surface layer and subsoil and slow in the substratum.

Of minor extent are Punsit, Nassau, Manlius, and Alden soils. Very poorly drained Alden soils are in concave areas and drainageways. Shallow Nassau soils and moderately deep Manlius soils are on adjacent bedrock-controlled landforms. Punsit soils are somewhat poorly drained and are lower on the landscape than Pittstown and Bernardston soils.

The areas of this unit used for farming are mostly in pasture and hay. A few areas are in corn and other row crops. Tile drainage is common in farmed areas. Stripcropping and contour farming help to reduce erosion on sloping areas.

The other areas of the unit are brushland or

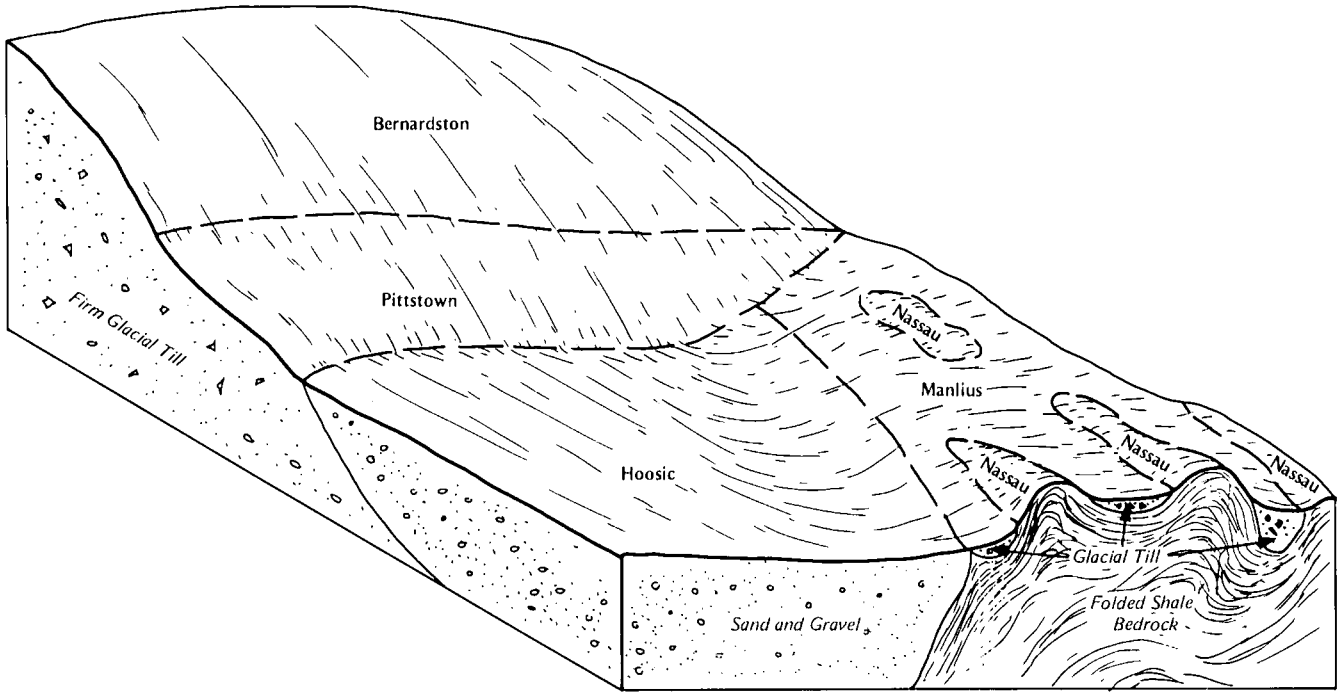

Figure 4.—Typical pattern of Pittstown, Bernardston, Nassau, and Manlius soils on uplands and Hoosic soils on outwash plains.

woodland. Erosion is a hazard on woodlots managed for timber or firewood, particularly where large equipment is used for harvest.

Slow percolation rates in the substratum, a seasonal high water table, and slope are the main limitations of the unit for community development.

5. Nassau-Manlius

Dominantly gently sloping to very steep, well drained to excessively drained, medium textured soils that are shallow and moderately deep to bedrock; on bedrock-controlled uplands

This unit consists of soils that formed in medium textured glacial till dominated by shale. The landscape generally consists of folded bedrock ridges oriented north-south. Outcroppings of shale bedrock are common, particularly in steep and very steep areas.

This unit makes up about 34 percent of the county. The unit is 70 percent Nassau soils, 10 percent Manlius soils, and 20 percent soils of minor extent (fig. 4).

The Nassau soils are somewhat excessively drained and are less than 20 inches deep to hard shale bedrock. They are more than 35 percent shale fragments. Permeability of the Nassau soils is moderate, and slopes range from 1 to 35 percent. Large outcrops are in some areas.

The Manlius soils are well drained to excessively drained and are from 20 to 40 inches deep to shale bedrock.They are more than 35 percent shale fragments. Permeability of the Manlius soils is moderate, and slopes range from 0 to 25 percent.

Of minor extent are Stockbridge, Pittstown, Sun, Alden, Palms, and Carlisle soils. Stockbridge soils are on adjacent uplands of very deep glacial till. Pittstown soils are also on very deep till landforms and have a firm substratum. Sun and Alden soils are poorly drained and very poorly drained and formed in glacial till in concave areas and drainageways. Palms and Carlisle soils are organic soils in concave areas where water is impounded. Palms soils have an organic layer 16 to 51 inches thick, and Carlisle soils have an organic layer thicker than 51 inches.

The uses of this unit vary widely. Slope and the depth to bedrock are the main limitations. Deeper, less sloping areas of Manlius soils are used for corn or other annual crops or for hay or pasture. Shallower, more sloping areas of Manlius soils are used for hay or improved pasture. The deeper, less sloping areas of Nassau soils are mainly used for pasture or hay. The

shallow or steep areas of Nassau soils are brushland or woodland. Orchards and vineyards, once established, do very well on this unit. The soils are highly erodible, especially where the surface is exposed. They are limited in productivity by droughtiness, slope, and areas of rock outcrop.

The depth to bedrock and the slopes are the main limitations for community development.

Large areas of this unit are in woodlands managed for firewood and timber. Erosion is a hazard on wooded areas during harvesting.

6. Limerick-Occum-Fluvaquents-Udifluvents

Dominantly nearly level, very deep soils on flood plains

This unit consists of soils that formed in recent alluvial deposits adjacent to the major streams of the county.

This unit covers about 6 percent of the county. Limerick soils make up about 20 percent of the unit, Occum soils about 16 percent, Fluvaquents about 16 percent, Udifluvents about 8 percent, and soils of minor extent about 40 percent.

The Limerick soils are poorly drained and medium textured. The rate of water movement through the surface layer, subsoil, and substratum is moderate. The seasonal high water table is between the surface and a depth of 18 inches from November to June. Limerick soils are in narrow areas that are subject to frequent flooding for brief periods from November to May.

The Occum soils are well drained and have a medium textured surface layer and subsoil. The substratum is very gravelly and coarse textured. The rate of water movement through the subsoil is moderate and moderately rapid. It is rapid in the substratum. Occum soils are on broad areas that are subject to occasional flooding for brief periods from February to April.

The Fluvaquents and Udifluvents are on the part of the flood plain where scouring and redeposition of sediment occur, causing wide variation in texture. The Fluvaquents are somewhat poorly drained to very poorly drained. The Udifluvents are excessively drained to moderately well drained. The Fluvaquents and Udifluvents are frequently flooded.

Of minor extent are Linlithgo, Halsey, Walpole, Carlisle, and Palms soils and Saprists and Aquents. Somewhat poorly drained Linlithgo soils are in low areas of the flood plains, and somewhat poorly drained and poorly drained Walpole soils are on outwash plains. Very poorly drained Saprists and Aquents and Carlisle, Palms, and Walpole soils are in old oxbows and slackwater areas.

Most areas of this unit, especially the Limerick soils, are wooded or are in water-tolerant brush and sedges. The Occum soils are well suited to farming. All of the soils in this unit are subject to seasonal flooding, and streambank erosion is a hazard in places. Some areas of this unit have surface stones that interfere with tillage and harvesting.

This unit is not suited to community development because of flooding.

7. Macomber-Taconic

Dominantly shallow and moderately deep, somewhat excessively drained and well drained, medium textured soils that formed in glacial till; on uplands at an elevation of more than 1,000 feet

This unit consists of gently sloping to very steep soils on bedrock-controlled hillsides in the eastern part of the county. Slopes range from 3 to 45 percent.

These soils make up 9 percent of the county. The unit is about 40 percent Macomber soils, 35 percent Taconic soils, and 25 percent minor soils.

The Macomber soils are well drained and are 20 to 40 inches deep to folded shale, schist, or phyllite bedrock. They are more than 35 percent rock fragments. Permeability of the Macomber soils is moderate.

The Taconic soils are somewhat excessively drained and are 10 to 20 inches deep to folded shale, schist, and phyllite bedrock. They are more than 35 percent rock fragments. Permeability of the Taconic soils is moderate.

Of minor extent are Lanesboro, Monarda, and Aurelie soils. Well drained Lanesboro soils and poorly drained Monarda soils have a firm substratum. Aurelie soils are poorly drained. In some areas the soil is less than 10 inches deep to bedrock, and outcroppings of bedrock are common, particularly in steep and very steep areas.

Most areas of these soils are wooded, mainly with sugar maple, American beech, hemlock, white oak, and red oak. The wooded areas are mostly steep and are subject to erosion during harvesting. Some areas of deeper soil are used for improved pasture. Much of the acreage of Taconic State Park is in this unit and is used for recreation purposes.

Droughtiness, slope, rock outcrops, and a 90- to 130-day growing season are the main limitations for farming. Slopes and the depth to bedrock are the main limitations for community development.

8. Lanesboro-Monarda

Dominantly gently sloping to steep, very deep, well drained and poorly drained, medium textured soils with a dense substratum; on uplands at an elevation of more than 1,000 feet

This unit consists of soils that formed in glacial till with a large content of shale and phyllite. The slopes range mainly from 3 to 35 percent; a few areas have slopes of as much as 45 percent.

The unit covers 3 percent of the county. Lanesboro soils make up about 70 percent of this unit, Monarda soils about 15 percent, and minor soils about 15 percent.

The Lanesboro soils are well drained. Permeability is moderate in the surface layer and subsoil and slow in the substratum. The depth to the perched seasonal high water table is about 18 to 30 inches from February through April.

The Monarda soils are poorly drained. Permeability is moderate in the surface layer and upper part of the subsoil. Permeability in the substratum is slow or very slow. The seasonal high water table is between the surface and a depth of 18 inches from October to May.

Of minor extent are Aurelie, Macomber, and Taconic soils. Aurelie soils are poorly drained and are in low spots and drainageways. Macomber and Taconic soils are in areas where the depth to bedrock is less than 40 inches.

Most areas of this unit are wooded. A few areas are used for hay or pasture. The main limitations for farming are slope and the short growing season. The dense substratum also perches the seasonal high water table and restricts root penetration. Where inclusions of wetter soils are common, subsurface drains will improve the suitability of this unit for crops if slope is not a limitation.

This unit has a moderate potential productivity for trees. Slope is the main limitation and makes operation of harvest equipment difficult. Building log trails and access roads across slopes or on the contour helps to reduce erosion during and after timber harvest.

Slow permeability in the substratum and slope are the main limitations for most types of community development and recreation uses.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Unadilla silt loam, 3 to 8 percent slopes, is one of several phases in the Unadilla series.

Some map units are made up of two or more major soils. These map units are called soil complexes, soil associations, or undifferentiated groups.

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Stockbridge-Farmington silt loams, undulating, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Lanesboro-Monarda association, strongly sloping, very stony, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in the mapped areas are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Livingston and Madalin soils is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, quarry, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

Ad—Alden mucky silt loam. This soil is very deep, nearly level, and very poorly drained. It is in drainageways adjacent to hillsides and between sloping soils. The areas are long and narrow and generally are oriented north-south. They range from 5 to 15 acres. Slopes are smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 7 inches, black mucky silt loam

Subsoil:
7 to 11 inches, dark gray silt loam with yellowish brown mottles
11 to 28 inches, gray silt loam with olive yellow and yellowish brown mottles

Substratum:
28 to 60 inches, gray gravelly loam with yellowish brown mottles

Included with this soil in mapping are small areas of moderately well drained Pittstown soils, somewhat poorly drained Punsit soils, and poorly drained and very poorly drained Sun soils. The Pittstown and Punsit soils are in small convex areas and make up about 10 percent of the unit. The Sun soils are not quite so wet as Alden soils and do not have a mucky surface layer. Inclusions make up about 20 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer, moderately slow in the subsoil, and moderately slow or slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and slightly acid to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to seasonal high water table: 1 foot above the surface to a depth of 6 inches (November to June)

Most areas of this soil are in woodland. Some areas are used as wetland wildlife habitat or are in water-tolerant brush and sedges.

The soil is poorly suited to cultivated crops. The seasonal high water table is the main limitation. Artificial drainage, by tile or open ditch, for example, will shorten the period of wetness but will not sufficiently dry the soil for cultivation during most years. However, because this soil generally is in long, narrow areas adjacent to better drained soils, it often provides an outlet for surface and tile drains from those soils.

This soil is only moderately suited to hay and pasture. The seasonal high water table restricts root growth for most preferred pasture grasses and legumes. Grazing when the soil is wet will cause compaction of the surface layer and damage to desirable pasture grasses.

The potential productivity for red maple on this soil is moderate. The high water table limits the use of equipment and causes seedling mortality and windthrow. The soil is wet and soft most of the year, and trafficability is limited to times when it is frozen.

The high water table and ponding on the surface are the main limitations of this soil as a site for dwellings with basements. Extensive drainage and sealing of basement walls are required to reduce the water damage to homes on this soil. The limitations are less severe for dwellings without basements. Included areas of Punsit and Pittstown soils are seasonally wet but can be drained more easily. The seasonal wetness of the included Sun soils is nearly as severe as that of this Alden soil.

Seasonal wetness and frost action are the main limitations of this soil as a site for local roads and streets. The soil is soft when wet, and heavy traffic will cause the pavement to fold and crack. Replacing the mucky surface layer and providing a coarse-grained, well drained subgrade will help prevent damage from frost action. Installing drainage will help to eliminate damage caused by the high water table, but because Alden soils are usually in the lowest position in the landscape, drainage outlets are difficult to establish.

The high water table and the permeability in the subsoil and substratum are the main limitations of this soil as a site for septic tank absorption fields. Special design is necessary for onsite waste disposal because of saturation and seepage. The included areas of Pittstown, Punsit, and Sun soils are limited for septic tank absorption fields by slow permeability and seasonal wetness.

The capability subclass is IVw.

Au—Aurelle silt loam. This soil is very deep, nearly level, and poorly drained. It is between hills at the base of steeper soils and in low pockets on hillsides and on hilltops and mountaintops at an elevation of 1,000 feet or more. The areas are long and narrow or nearly round. They range from 10 to 50 acres. Slopes are

complex and irregular, particularly in the long and narrow units, and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, very dark grayish brown silt loam

Subsoil:
6 to 14 inches, grayish brown channery silt loam with dark yellowish brown and reddish brown mottles
14 to 22 inches, olive gray channery silt loam with strong brown and yellowish brown mottles

Substratum:
22 to 60 inches, grayish brown, firm channery silt loam with strong brown mottles

Included with this soil in mapping are small areas of well drained Lanesboro soils and poorly drained Monarda soils. The Lanesboro soils are on slightly higher, convex areas and make up about 10 percent of the unit. The Monarda soils are slightly more clayey than this Aurelie soil. They make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow or very slow in the substratum
Available water capacity: High
Soil reaction: Extremely acid to moderately acid in the surface layer, very strongly acid to slightly acid in the subsoil, and strongly acid to neutral in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: Surface to 6 inches (September to May)
Root zone: Restricted by the substratum at a depth of 22 inches

Most areas of this soil are in woodland. The other areas are used as wetland wildlife habitat and are in water-tolerant sedges and brush.

This soil is poorly suited to crops. The seasonal high water table and short growing season at the high elevation are the main limitations. Drainage systems, by tile or open ditch, for example, will shorten the period of wetness but not adequately for cultivation in most years.

This unit is only moderately suited to hay or pasture. The water table restricts root growth for most preferred pasture grasses and hay and legumes.

The potential productivity for red maple is low on this soil. The high water table limits the use of equipment and causes windthrow and moderate seedling mortality. The soil is wet and soft most of the year, making operation of larger harvest equipment difficult. Shallow-rooted trees are easily blown over during windstorms.

Wetness is the main limitation of this soil as a site for dwellings with basements. Extensive drainage and sealing of basement walls are required to reduce the water damage to homes on this soil. The limitation is less severe for dwellings without basements. The included areas of Lanesboro soils have fewer limitations for dwellings, but the Monarda soils also are limited by wetness.

Wetness and frost action are the main limitations of this soil as a site for local roads and streets. The soil is soft when wet, and heavy traffic will cause the pavement to fold and crack. Drainage, raised fill, or a coarse-grained, well drained subgrade will help prevent damage to roads from frost action and wetness.

Wetness and the permeability in the subsoil and substratum are the main limitations of this soil as a site for septic tank absorption fields. Special design is necessary for onsite waste disposal on this soil because of saturation and seepage. The included areas of Lanesboro soils are limited for septic tank absorption fields by slow permeability but are better suited than Aurelie soils.

The capability subclass is IVw.

BeB—Bernardston silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on small hills, hilltops, and tops of drumlins. The areas are oval or irregularly shaped. They range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown silt loam

Subsoil:
8 to 15 inches, light olive brown silt loam and 10 percent rock fragments
15 to 22 inches, light olive brown silt loam with dark brown mottles and 10 percent rock fragments

Substratum:
22 to 42 inches, olive gray, firm and dense

channery silt loam and 20 percent rock fragments (shale)
42 to 60 inches, olive gray, firm and dense channery silt loam and 20 percent rock fragments (shale)

Included with this soil in mapping are a few small areas of moderately well drained Pittstown soils, somewhat poorly drained Punsit soils, and poorly drained and very poorly drained Alden soils. The Pittstown soils are at the lower margins of gentle slopes and make up about 10 percent of the unit. The Punsit soils are in slightly lower and concave areas, and the Alden soils are in depressions and drainageways. They make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid or moderately acid throughout
Surface runoff: Medium
Erosion hazard: Slight
Depth to the seasonal high water table: Perched at a depth of 1.5 to 2 feet (February to April)
Rooting zone: Restricted by the substratum at a depth of 22 inches

This soil is classified as prime farmland. Most areas are used for hay or pasture. A few areas are in cultivated crops, and the rest are wooded.

This soil is well suited to cultivated crops and hay in rotation or to permanent hay. The seasonal high water table slightly delays spring tillage and prevents the soil from warming for early germination of seeds. Subsurface drains, particularly those that drain wetter inclusions, and interceptor drains to divert surface and subsurface water from higher adjacent soils will reduce wetness. Contour farming, cover crops, conservation tillage, crop rotations, and tillage at the proper soil moisture content will reduce erosion, improve tilth, and maintain productivity.

This soil is well suited to pasture. Grazing when the soil is wet will cause compaction of the surface layer and destroy or damage desirable pasture plants. Proper stocking rates, rotation grazing, restricted grazing when the soil is wet, and lime and fertilizer are needed to maintain pasture productivity.

The potential productivity for northern red oak on this soil is moderately high. Windthrow is a hazard during heavy windstorms, particularly where the substratum restricts root penetration by larger trees.

Seasonal wetness and the substratum limit the soil as a site for dwellings with basements. Subsurface drains and interceptor drains that divert water from surrounding slopes away from the dwelling, footing or foundation drains backfilled with gravel, and waterproofed basement walls will reduce the risk of water damage to basements. Subsurface drains are also needed for dwellings without basements.

Slow percolation is the main limitation of the soil as a site for conventional septic tank absorption fields. Enlarging the absorption field or the trenches below the distribution lines will increase the absorption of effluent.

This soil is suitable for recreation facilities such as hiking trails, playgrounds, and picnic areas. Athletic fields need subsurface drainage.

The capability subclass is IIe.

BeC—Bernardston silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. It is on hills, side slopes, and drumlins. The areas are oval or irregularly shaped. They range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown silt loam

Subsoil:
8 to 15 inches, light olive brown silt loam and 10 percent rock fragments
15 to 22 inches, light olive brown silt loam with dark brown mottles and 10 percent rock fragments

Substratum:
22 to 42 inches, olive gray, firm and dense channery silt loam and 20 percent rock fragments (shale)
42 to 60 inches, olive gray, firm and dense channery silt loam and 20 percent rock fragments (shale)

Included with this soil in mapping are a few small areas of moderately well drained Pittstown soils, somewhat poorly drained Punsit soils, and poorly drained and very poorly drained Alden soils. The Pittstown soils are at the lower margins of slopes and make up about 5 percent of the unit. The Punsit soils are in slightly lower and concave areas and make up about 5 percent of the unit. The Alden soils are in

depressions and drainageways and make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid or moderately acid throughout
Surface runoff: Rapid
Erosion hazard: Moderate
Depth to the seasonal high water table: Perched at a depth of 1.5 to 2 feet (February to April)
Root zone: Typically restricted by the substratum at a depth of 22 inches

Most areas of this soil are in permanent hay or pasture. The other areas are wooded.

This soil is moderately suited to cultivated crops. The seasonal high water table, slope, an erosion hazard, and the restricted rooting depth are the main limitations. The seasonal high water table prevents the soil from warming in the spring for early seed germination and delays tillage. Interceptor drains that divert water from higher adjacent slopes and a subsurface drainage pattern that drains the wetter Pittstown, Punsit, and Alden soils will help improve conditions for early tillage and seed germination. The erosion hazard on some long cultivated slopes is severe. Sod in the crop rotation, conservation tillage, contour farming, stripcropping, and cover crops reduce the erosion hazard, improve tilth, and increase the moisture holding capacity by increasing organic matter content.

This soil is moderately well suited to pasture. Grazing when the soil is wet will destroy desirable grasses and cause punctures in and compaction of the surface layer.

The potential productivity for northern red oak on this soil is moderately high. Seedling mortality is low, and there are no major restrictions for the use of equipment. Erosion is severe where timber harvesting damages the plant cover. Windthrow is a hazard where the substratum restricts root penetration.

The seasonal high water table, the substratum, and slope are the main limitations of the soil as a site for dwellings with basements. Subsurface drainage and interceptor drains that divert water from surrounding slopes away from the dwelling, foundation drains backfilled with gravel, and waterproofed basement walls will reduce the risk of water damage to basements. Dwellings without basements also need subsurface drainage. Maintaining a plant cover during construction and seeding and mulching lawns quickly will help to reduce erosion.

Slow percolation is the main limitation of the soil as a site for septic tank absorption fields. Enlarging the absorption field or the trenches below the distribution lines will increase the absorption of effluent.

This soil is suitable for recreation facilities such as hiking trails, playgrounds, and picnic areas. The slow permeability, the seasonal high water table, and slope limit its use for athletic fields.

The capability subclass is IIIe.

BeD—Bernardston silt loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and well drained. It is on hillsides and on shoulder slopes of drumlins. The areas are long and narrow and mainly are oriented north-south. Some of the areas on drumlins are narrow and curved. The areas of this soil range from 5 to 15 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown silt loam

Subsoil:
8 to 15 inches, light olive brown silt loam and 10 percent rock fragments
15 to 22 inches, light olive brown silt loam with dark brown mottles and 10 percent rock fragments

Substratum:
22 to 42 inches, olive gray, firm and dense channery silt loam and 20 percent rock fragments (shale)
42 to 50 inches, olive gray, firm and dense channery silt loam and 20 percent rock fragments (shale)

Included with this soil in mapping are a few small areas of somewhat poorly drained Punsit soils and poorly drained and very poorly drained Alden soils. The Punsit soils are in eroded, dissected areas on slope faces and make up about 5 percent of the unit. The Alden soils are in narrow drainageways and make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High

Soil reaction: Strongly acid or moderately acid throughout
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: Perched at a depth of 1.5 to 2 feet (February to April)
Root zone: Typically restricted by the substratum at a depth of 22 inches

A few areas of this soil are in permanent hay or pasture. Most areas are wooded.

This soil is poorly suited to cultivated crops. Erosion and slope are the main limitations. Erosion, mainly gully erosion, is especially severe where cover crops or sod have been removed. Several years of close-growing crops in the rotation, stripcropping, diversion ditches, contour farming, cover crops, and conservation tillage will help to reduce erosion. Operation of tillage and harvest equipment on steep slopes, especially at the upper limits of the slope range, is unsafe.

The soil is moderately suited to hay and pasture. Proper stocking rates, rotation grazing, and restricted grazing when the soil is wet will protect the pasture. Erosion is a hazard if pastures are overgrazed.

The potential productivity for northern red oak on this soil is moderately high. Slope is the main limitation for equipment use. Logging and skid trails on the contour will help prevent formation of gullies.

The main limitation of the soil as a site for dwellings with basements is slope. Designing the dwelling to conform to the natural slope or land shaping and grading will help overcome the slope. Maintaining the plant cover at construction sites and using temporary control structures will help reduce erosion. Establishing a plant cover soon after construction also helps to control erosion.

The main limitation of the soil as a site for local roads and streets is slope. Constructing roads and streets on the contour or land shaping and grading will help overcome the slope.

Slow percolation and slope are the main limitations of the soil as a site for septic tank absorption fields. Inclusions in this unit that are less sloping are better suited. Distribution lines on the contour and distribution boxes or other structures that permit even distribution of effluent will increase the efficiency of the system on the slope. Increasing the size of the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IVe.

BeE—Bernardston silt loam, 25 to 35 percent slopes. This soil is very deep, steep, and well drained. It is on hillsides and on shoulder slopes of drumlins and escarpment faces on the uplands. The areas are long and narrow and commonly are oriented north-south. Some areas are curved. The areas of this soil range from 10 to 25 acres. Slopes are short and uniform.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown silt loam

Subsoil:
8 to 15 inches, light olive brown silt loam and 10 percent rock fragments
15 to 25 inches, light olive brown silt loam with dark brown mottles and 10 percent rock fragments

Substratum:
22 to 42 inches, olive gray, dense and firm channery silt loam and 20 percent rock fragments (shale)
42 to 60 inches, olive gray, dense and firm channery silt loam and 20 percent rock fragments (shale)

Included with this soil in mapping are a few small areas of somewhat poorly drained Punsit soils and poorly drained and very poorly drained Alden soils. The Punsit soils are at the bottom of dissections or on slumps along very steep erosion faces. They make up about 5 percent of the unit. The Alden soils make up about 5 percent of the unit and are in narrow drainageways across very steep slopes. Some included areas are very severely eroded.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid or moderately acid throughout
Depth to the seasonal high water table: Perched at a depth of 1.5 to 2 feet (February to April)
Surface runoff: Rapid
Erosion hazard: Very severe
Root zone: Typically restricted by the substratum at a depth of 22 inches

This soil mainly is wooded.

Slope is the main limitation of this soil for farming. The soil is too steep for most types of farm machinery or to manage for pasture.

The potential productivity for northern red oak on this soil is moderately high. Slope limits the use of equipment. Logging and skid trails on the contour or across the slope will prevent the formation of gullies. Gully erosion along the logging and skid trails is especially severe when the plant cover is disturbed or destroyed by heavy equipment. Windthrow from erosion and on slopes is common.

Slope is the main limitation of the soil as a site for dwellings with basements. Some inclusions of Bernardston soils in this unit are better suited. Maintaining a plant cover and using temporary control structures during construction will help reduce erosion. Establishing a plant cover soon after construction also helps control erosion.

Slope is the main limitation of the soil as a site for local roads and streets. Constructing roads and streets on the contour or land shaping and grading will help overcome the slope.

Slow percolation and slope are the main limitations of the soil as a site for septic tank absorption fields. Less sloping areas of Bernardston and other soils in adjacent areas are better suited.

The capability subclass is VIe.

Bh—Birdsall silt loam. This soil is very deep, very poorly drained, and nearly level. It is in depressions, along drainageways, and in dissections. The areas of this soil are generally irregular in shape and conform to the natural drainageways of the area. The areas range from 5 to 50 acres. Slopes are generally smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:

surface to 9 inches, very dark brown silt loam

Subsoil:

9 to 13 inches, grayish brown silt loam with yellowish brown mottles

13 to 18 inches, grayish brown silt loam with strong brown mottles

18 to 25 inches, gray silt loam with yellowish brown mottles

Substratum:

25 to 35 inches, gray very fine sandy loam with yellowish red, brown, and strong brown mottles

35 to 46 inches, dark gray loam with olive brown mottles

46 to 60 inches, variegated dark gray, strong brown, and grayish brown, varved silt, clay, and very fine sand

Included with this soil in mapping are small areas of poorly drained Raynham soils and moderately well drained Scio soils. The Raynham soils are on slightly higher areas, and the Scio soils are on small knolls. The Raynham and Scio soils make up about 20 percent of the unit.

Soil properties—

Permeability: Moderately slow or moderate in the surface layer, moderately slow in the subsoil, and slow in the substratum

Available water capacity: High

Soil reaction: Very strongly acid to moderately acid in the surface layer and strongly acid to neutral in the subsoil and substratum

Surface runoff: Very slow or ponded

Erosion hazard: Slight

Depth to the seasonal high water table: 1 foot above the surface to a depth of 1 foot (October to July)

Most areas of this soil are in woodland or pasture. A few areas are in cropland.

Seasonal wetness and ponding make this soil unsuited to cultivated crops. Artificial drainage is difficult to establish in places because of a lack of suitable outlets.

Seasonal wetness and ponding make this soil poorly suited to pasture and hay. Grazing livestock damage desirable plants and soil structure during periods of wetness. Proper stocking rates, rotation grazing, and deferred grazing during wet periods are the chief pasture management needs.

The potential productivity for red maple on this soil is moderate. The wetness and ponding restrict the use of heavy equipment and cause high seedling mortality. Also, the rooting depth is restricted by the seasonal high water table, and some trees are blown over by winds.

Wetness is the main limitation of the soil as a site for dwellings with basements. Inclusions of Scio soils in this unit on small knolls and other nearby soils that are better drained are better suited to dwellings.

Wetness is the main limitation of the soil as a site for local roads and streets. Raised fill material and a

drainage system will reduce wetness.

Wetness and the permeability in the subsoil and substratum are the main limitations of this soil as a site for septic tank absorption fields. Special design is necessary to manage onsite waste disposal on this soil because of saturation and seepage. Scio and Unadilla soils are limited by slow permeability but are better suited than this Birdsall soil.

The capability subclass is Vw.

BlA—Blasdell channery loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and well drained. It is on outwash plains and stream terraces. The areas range from 3 acres to about 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, brown channery loam and 30 percent rock fragments

Subsoil:
10 to 20 inches, yellowish brown channery loam and 20 percent rock fragments
20 to 30 inches, dark yellowish brown very channery loam and 40 percent rock fragments

Substratum:
30 to 40 inches, dark yellowish brown extremely channery loam and 75 percent rock fragments
40 to 60 inches, dark brown extremely channery silt loam and 75 percent rock fragments

Included with this soil in mapping are small areas of poorly drained to somewhat poorly drained Fredon soils and very poorly drained Palms and Carlisle soils in depressions and along drainageways. Also included are small areas of more sandy Hoosic and Knickerbocker soils and soils with slopes of more than 3 percent. A few wet spots or small gravel pits are indicated on the map by special symbols. Included areas range from less than 1 acre to 3 acres. They make up about 10 percent of the unit.

Soil properties—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to slightly acid in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are used for farming. Some areas are wooded. This soil is classified as prime farmland.

This soil is well suited to cultivated crops. It is easy to work and can be cultivated early in spring. If this soil is properly managed, it is well suited to special fruit and vegetable crops and transplanted crops. Stones on the surface limit the use of some types of machinery. Crop residue on and in the soil, conservation tillage, and a cover crop help maintain good tilth. Lack of moisture during dry periods is a limitation, but this soil takes in irrigation water readily. The use of irrigation increases productivity and broadens the variety of suitable crops. Natural fertility is low, and fertilizer is needed. Large amounts of lime are needed for some crops.

This soil is well suited to pasture. Adequate moisture for desirable pasture plants is the main limitation. Rotation grazing, proper stocking rates, and restricted grazing during dry periods help maintain desirable and productive pasture plants.

The potential productivity of this soil for northern red oak is moderately high. Machine planting of seedlings is feasible, but gravel hinders some planting operations.

This soil has few or no limitations as a site for dwellings with basements or for septic tank absorption fields. Droughtiness hinders the establishment and maintenance of lawns.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

The capability subclass is IIs.

BlB—Blasdell channery loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on outwash plains, stream terraces, and beach remnants. The areas are typically broad, irregularly shaped, and more than 15 acres each.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, brown channery loam and 30 percent rock fragments

Subsoil:
10 to 20 inches, yellowish brown channery loam and 20 percent rock fragments
20 to 30 inches, dark yellowish brown very channery loam and 40 percent rock fragments

Substratum:
30 to 40 inches, dark yellowish brown extremely channery loam and 75 percent rock fragments
40 to 60 inches, dark brown extremely channery silt loam and 75 percent rock fragments

Included with this soil in mapping are small areas of poorly drained to somewhat poorly drained Fredon soils and very poorly drained Palms and Carlisle soils in depressions and along drainageways. Also included are areas of more sandy Hoosic and Knickerbocker soils and soils with slopes of less than 3 percent or more than 8 percent. A few wet spots or small gravel pits are indicated on the map by special symbols. Included areas range from less than 1 acre to 3 acres. They make up about 10 percent of this unit.

Soil properties—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to slightly acid in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are used for farming. Some areas are wooded. This soil is classified as prime farmland.

This soil is well suited to all crops commonly grown in the county, especially to deep-rooted perennial crops. If this soil is properly managed, it is well suited to special fruit and vegetable crops and transplanted crops. Stones on the surface limit the use of some types of machinery. Lime and fertilizer are needed for most crops, and the soil readily leaches fertilizer. The soil is generally easy to keep in good tilth, but sod crops, crop residue in and on the soil, and heavy applications of manure help to improve moisture holding capacity and tilth. Irrigation will improve crop yields and broaden the variety of suitable crops, especially high-value specialty crops such as strawberries, potatoes, and sweet corn.

This soil is well suited to pasture. Rotation grazing, proper stocking rates, and restricted grazing during dry periods help maintain desirable and productive pasture plants.

The potential productivity of this soil for northern red oak is moderately high. Machine planting of seedlings is feasible, but gravel fragments hinder some operations.

The soil has few or no limitations as a site for dwellings with basements or for septic tank absorption fields. Droughtiness hinders the establishment and maintenance of lawns.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

The capability subclass is IIs.

BIC—Blasdell channery loam, rolling. This soil is very deep and well drained. It is along valley sides and kame-kettle areas on lateral and terminal moraines. The areas are long and narrow and range from 5 to about 30 acres. In the kame-kettle areas, slopes are short and complex and range from 5 to 15 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, brown channery loam and 30 percent rock fragments

Subsoil:
10 to 20 inches, yellowish brown channery loam and 20 percent rock fragments
20 to 30 inches, dark yellowish brown very channery loam and 40 percent rock fragments

Substratum:
30 to 40 inches, dark yellowish brown extremely channery loam and 75 percent rock fragments
40 to 60 inches, dark brown extremely channery silt loam and 75 percent rock fragments

Included with this soil in mapping are small areas of somewhat poorly drained to poorly drained Fredon soils and very poorly drained Palms and Carlisle soils in depressions on foot slopes. Also included are areas of more sandy Hoosic and Knickerbocker soils and areas where the slopes are more than 15 percent or less than 5 percent. A few wet spots and small gravel pits are indicated on the map by special symbols. Included areas range from less than 1 acre to 3 acres. They make up about 10 percent of the unit.

Soil properties—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to slightly acid in the substratum
Surface runoff: Medium

Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are used for farming. Some are used as a source for sand and gravel.

This soil is well suited to tree fruits, vineyards, and forage crops that require good drainage and deep rooting. The soil can be worked and planted early and, where erosion is controlled, is suitable for small fruits and vegetables. Lime and fertilizer are needed.

This soil is moderately suited to cultivated crops. Erosion is particularly severe on the upper limits of the slope range. Contour planting, stripcropping, and crop residue in and on the soil help control or reduce soil erosion. Crop residue and conservation tillage are especially needed where slopes are short and complex and contour planting is not practical. The soil takes in water at a moderately rapid rate, but it is not well suited to irrigation because of the hazard of erosion.

This soil is moderately well suited to pasture. Droughtiness is a main limitation, and erosion is severe if the pasture is subject to overgrazing.

The potential productivity of this soil for northern red oak is moderately high. Sugar maple and northern red oak are common on the soil. Sugar maple, red pine, and European larch are the main reforestation trees. Machine planting of seedlings is feasible, but gravel fragments hinder some planting operations.

Slope is the main limitation of the soil as a site for dwellings. Designing the dwellings to conform to the natural slope will help overcome this limitation.

Slope and frost action are the main limitations of the soil as a site for local roads and streets. Constructing roads on the contour of the land will help overcome the slope, and constructing roads on coarse-grained subgrade or base material will reduce frost action.

Slope is the main limitation of the soil as a site for septic tank absorption fields. Placing distribution lines on the contour and using distribution boxes or other structures to promote even distribution of effluent will increase the efficiency of the system on the rolling slopes.

Erosion is a hazard during construction. Minimizing the removal of plant cover and establishing a plant cover as soon as possible after construction will reduce erosion.

The capability subclass is IIIe.

BID—Blasdell channery loam, hilly. This soil is very deep and well drained. It is along the sides of outwash terraces and kame-kettle areas. The areas range from 3 to about 15 acres and are long and narrow. Slopes range from 10 to 30 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, brown channery loam and 30 percent rock fragments

Subsoil:
10 to 20 inches, yellowish brown channery loam and 20 percent rock fragments
20 to 30 inches, dark yellowish brown very channery loam and 40 percent rock fragments

Substratum:
30 to 40 inches, dark yellowish brown extremely channery loam and 75 percent rock fragments
40 to 60 inches, dark brown extremely channery silt loam and 75 percent rock fragments

Included with this soil in mapping are small areas of poorly drained and somewhat poorly drained Fredon soils and very poorly drained Palms and Carlisle soils in depressions. Also included are areas of more sandy Hoosic soils and areas where slopes are less than 10 percent or more than 30 percent. Inclusions make up about 15 percent of this unit.

Soil properties—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to slightly acid in the substratum
Surface runoff: Medium or rapid
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are in brush or woodland.

Slope is the major limitation of this soil for most farm uses, and most farmed areas are used for hay. The operation of most types of farm equipment is difficult and hazardous because of the short, uneven slopes and irregular topography. The difficulty of working these soils and the hazard of erosion make sod crops more practical to grow than cultivated crops. Careful harvesting and lime and fertilizer are needed for legume and grass mixtures for hay or pasture.

If this soil is cultivated, maintaining a plant cover for as long as possible and cultivating on the less sloping

areas of the unit will help control erosion. This soil is only moderately suited to pasture because of droughtiness, slope, and severe erosion.

The potential productivity of this soil for northern red oak is moderately high. Slope limits the use of equipment.

Slope is the main limitation of the soil as a site for dwellings with basements. Designing dwellings to conform to the natural slope of the land will help overcome the slope. Some areas of the included Blasdell soils are less sloping and more suitable for buildings. Minimizing the removal of plant cover, using temporary erosion control structures during construction, and establishing a plant cover as soon as possible following construction will reduce erosion.

Slope and frost action are limitations of the soil as a site for local roads and streets. Constructing roads along the contour of the land will help overcome the slope, and constructing roads on coarse-grained subgrade or base material will reduce frost action.

Slope is the main limitation of the soil as a site for septic tank absorption fields. Adjacent areas of Blasdell soils that are less sloping are better suited. Placing distribution lines on the contour and using distribution boxes or other structures to promote even distribution of effluent will increase the efficiency of the system on the hilly slopes.

The capability subclass is IVe.

BmA—Blasdell channery silt loam, fan, 0 to 3 percent slopes. This soil is very deep, nearly level, and well drained. It is on low, wide areas near where streams flow out of higher adjacent hills and mountains. The areas are typically fan shaped. They range from 10 to 100 acres. Slopes are smooth and uniform.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown channery silt loam

Subsoil:
8 to 14 inches, yellowish brown silt loam
14 to 33 inches, dark yellowish brown very channery silt loam

Substratum:
33 to 60 inches, dark brown very channery sandy loam

Included with this soil in mapping are a few small areas of moderately well drained soils and somewhat poorly drained and poorly drained soils that are subject to flooding. These included soils are in low spots mainly on the fringes of the fan or near streams. They make up about 10 to 20 percent of the unit.

Soil properties—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to slightly acid in the substratum
Surface runoff: Slow
Surface hazard: Slight
Depth to the seasonal high water table: Mainly more than 6 feet but as little as 3 feet for brief periods in April and May
Root zone: Unrestricted
Flood frequency: Rare

Most areas of this soil are used for farming. The wooded areas are scattered, small, and generally adjacent to streams. This soil is classified as prime farmland.

This soil is well suited to most crops. It is easily tilled, but often is droughty during dry periods of the growing season. The flooding in some years damages crops or new seedings. Crop residue in or on the soil, cover crops, and conservation tillage will increase soil organic matter content, improve tilth, and increase water-holding capacity. Irrigation will also increase crop yields.

This soil is well suited to pasture, particularly for spring and fall grazing. Plant growth is sparse in midsummer, and droughtiness is a hazard to pasture grasses. Proper stocking rates, rotation grazing, lime and fertilizer, and weed and brush control will help maintain quality pasture grasses.

This soil has moderately high potential productivity for northern red oak. Seedlings survive and grow well. Some trees are blown over during windstorms.

Flooding is the main limitation of this soil as a site for dwellings with basements. Nearby Hoosic and Castile soils that are higher on the landscape and are not subject to flooding are better suited as building sites.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material will reduce frost action.

The seasonal high water table in this soil rises with the level of the water in the stream that flows into the fan. At times, this level is high enough to saturate septic tank absorption fields.

The capability subclass is IIs.

BmB—Blasdell channery silt loam, fan, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on low, wide areas near where streams flow out of higher adjacent hills and mountains. The areas are typically fan shaped. They range from 20 to 150 acres. Slopes are smooth and uniform.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown channery silt loam

Subsoil:
8 to 14 inches, yellowish brown silt loam
14 to 33 inches, dark yellowish brown very channery silt loam

Substratum:
33 to 60 inches, dark brown very channery sandy loam

Included with this soil in mapping are a few small areas of moderately well drained soils and somewhat poorly drained and poorly drained soils that are subject to flooding. These included soils are in low spots mainly on the fringes of the fan or near streams. They make up about 10 to 20 percent of the unit.

Soil properties—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to slightly acid in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: Mainly more than 6 feet but as little as 3 feet for brief periods in April and May
Root zone: Unrestricted
Flood frequency: Rare

Most areas of this soil are used for farming. The wooded areas are scattered, small, and generally adjacent to streams. This soil is classified as prime farmland.

This soil is well suited to most crops. It is easily tilled, but often is droughty during dry periods of the growing season. The flooding in some years damages crops or new seedings. Crop residue in or on the soil, cover crops, and conservation tillage will increase soil organic matter content, improve tilth, increase water-holding capacity, and reduce erosion, particularly on cropland at the steepest part of the slope.

This soil is well suited to pasture, particularly for spring and fall grazing. Plant growth is sparse in midsummer, and droughtiness is a hazard to pasture grasses. Proper stocking rates, rotation grazing, lime and fertilizer, and weed and brush control will help maintain quality pasture grasses.

This soil has moderately high potential productivity for northern red oak. Seedlings survive and grow well. Some trees are blown over during windstorms.

Flooding is the main limitation of this soil as a site for dwellings with basements. Nearby Hoosic and Castile soils that are higher on the landscape and are not subject to flooding are better suited as building sites.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material will reduce frost action.

The seasonal high water table in this soil rises with the level of the water in the stream that flows into the fan. At times, this level is high enough to saturate septic tank absorption fields.

The capability subclass is IIe.

Ca—Canandaigua silt loam. This soil is very deep, nearly level, and poorly drained or very poorly drained. It is along drainageways and in depressions. The areas are long and narrow and follow the natural drainageway or are irregularly shaped. They range from 5 to 25 acres. Slopes are smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, very dark gray silt loam

Subsoil:
8 to 34 inches, gray silt loam with yellowish brown mottles

Substratum:
34 to 60 inches, gray silt loam with dark grayish brown and yellowish brown mottles

Included with this soil in mapping are small areas of somewhat poorly drained Niagara soils on slightly higher slopes. These soils make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and

moderately slow in the subsoil and substratum
Available water capacity: High
Surface runoff: Very slow to ponded
Erosion hazard: Slight
Depth to the seasonal high water table: 1 foot above to 1 foot below the surface (November to May)

Most areas of this soil are in woodland. The other areas are used for pasture.

Seasonal wetness and ponding are the main limitations of this soil for cultivated crops. Artificial drainage is difficult to establish in places because of a lack of suitable outlets. Conservation tillage, crop residue on and in the soil, and cover crops improve tilth.

Seasonal wetness and ponding also restrict the use of this soil for pasture and hay. Grazing when the soil is wet damages the soil and the desirable pasture plants.

The potential productivity for red maple on this soil is moderate. The wetness and ponding restrict the use of equipment and cause high seedling mortality. Rooting is restricted by the seasonal high water table, and some trees are uprooted during windy periods.

Wetness is the main limitation of the soil as a site for dwellings with basements. Inclusions of Niagara soils on slightly higher areas in this unit and nearby Collamer soils, which are better drained, are also wet but better suited as sites for dwellings.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. Raised fill material and a drainage system will reduce wetness. A coarse-grained subgrade or base material will reduce frost action.

Wetness and the permeability in the subsoil and substratum are the main limitations of this soil and the included Niagara soils as sites for septic tank absorption fields. Special design is necessary to manage onsite waste disposal on this soil because of saturation and seepage in disposal areas.

The capability subclass is Vw.

Cc—Carlisle muck. This soil is very deep, nearly level, and very poorly drained. It is mainly in bogs on outwash and till plains and is on flood plains. The areas are oval, broad, or irregular in shape and range from 5 to 50 acres. Slopes range from 0 to 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface tier:
surface to 13 inches, black muck

Subsurface and bottom tiers:
13 to 80 inches, very dark gray muck

Included with this soil in mapping are a few areas of Palms soils that make up about 15 percent of the unit.

Soil properties—

Permeability: Moderately slow to moderately rapid
Available water capacity: High
Soil reaction: Very strongly acid to neutral
Surface runoff: Very slow or ponded
Erosion hazard: Slight, but the soil is susceptible to soil blowing and subsidence where drained
Depth to the seasonal high water table: 6 inches above the surface to 1 foot below the surface (September to June)
Root zone: Restricted by the high water table

Most areas of this soil are in woodland or cattails, sedges, and other water-tolerant grasses.

Seasonal wetness and the hazard of frequent ponding make this soil unsuited to crops or hay or pasture.

This soil has moderate potential for swamp white oak. Seasonal wetness restricts the use of equipment and causes high seedling mortality and shallow rooting. Only water-tolerant species are suitable for this soil.

Subsidence, ponding, and low strength are the main limitations of this soil as a site for dwellings with basements. Subsidence, ponding, and frost action are the main limitations for local roads and streets. Subsidence, ponding, and slow percolation are the main limitations for septic tank absorption fields.

The capability subclass is Vw.

Ce—Castile gravelly silt loam. This soil is very deep, nearly level, and moderately well drained. It is on broad areas of outwash plains and terraces. The areas are generally round or oval and range from 5 to 20 acres. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, brown gravelly silt loam and 15 percent rock fragments

Subsoil:
8 to 16 inches, yellowish brown gravelly loam and 25 percent rock fragments
16 to 24 inches, light olive brown very gravelly

sandy loam with grayish brown and yellowish brown mottles and 45 percent rock fragments

Substratum:
24 to 48 inches, grayish brown very gravelly loamy sand with brownish yellow and brown mottles and 35 percent rock fragments
48 to 72 inches, grayish brown layers of sand and gravel with many reddish yellow and brownish yellow mottles and 40 percent rock fragments

Included with this soil in mapping are a few small areas of somewhat excessively drained Hoosic soils and well drained Blasdell soils. Also included are a few small areas of somewhat poorly drained to poorly drained Fredon soils and very poorly drained Halsey soils in drainageways and depressional areas. Included soils make up about 15 to 20 percent of the unit.

Soil properties—

Permeability: Moderate to moderately rapid in the surface layer, moderately rapid in the subsoil, and rapid in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to neutral in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 2 feet (March to May)
Root zone: Typically to a depth of 24 inches

Most areas of this soil are farmed. This soil is classified as prime farmland.

This soil is suited to small grains, row crops, and hay and pasture. In some years seasonal wetness briefly delays tillage in spring. Gravel on the surface causes rapid wear of equipment and interferes with preparing smooth seedbeds for fine-seeded crops. Conservation tillage, grass and legume cover crops, and crop residue in and on the soil help maintain tilth, increase organic matter content, and improve the water-holding capacity.

This soil is well suited to pasture. Wetness in the spring and droughtiness mainly during midsummer are the main limitations. Rotation grazing during dry periods will prevent damage to pasture grasses from overgrazing.

The potential productivity of this soil for sugar maple is moderate. The soil is droughty during some particularly dry years. Adequate moisture for seedlings is available early in the spring.

Seasonal wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited as a site for dwellings without basements. Grading the land so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and adequately sealing the foundation will reduce wetness.

Wetness is the main limitation of the soil as a site for local roads and streets. Raised fill material and a drainage system will reduce wetness.

Wetness and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. The poor filtering causes a hazard of contamination to ground water.

The capability subclass is IIw.

CnB—Cazenovia silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained to moderately well drained. It is on the top of hills and at the base of long slopes. The areas of this soil are oval or broad and range from 5 to 50 acres. Slopes are generally smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, dark brown silt loam

Subsoil:
10 to 15 inches, reddish brown silty clay loam with pink silt and very fine sand as coatings
15 to 34 inches, dark brown silty clay loam with reddish brown clay films

Substratum:
34 to 60 inches, dark reddish gray silty clay loam and 10 percent rock fragments

Included with this soil in mapping are small areas of somewhat poorly drained Ovid soils in shallow depressions and along drainageways. They make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer, moderately slow in the subsoil, and slow in the substratum
Available water capacity: High
Soil reaction: Moderately acid to neutral in the surface layer and subsoil and neutral to moderately alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate

Depth to the seasonal high water table: 2 to 4 feet (March to May)
Root zone: Unrestricted

Most areas of this soil are in cropland, woodland, or pasture.

This soil is well suited to row crops. Conservation tillage, cover crops, and crop residue in and on the soil increase organic matter content, improve tilth, and control erosion.

This soil is well suited to hay and pasture. Sod crops help prevent erosion and reduce surface clodding and crusting.

The potential productivity of this soil for sugar maple is moderate.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Wetness and low strength are the main limitations of the soil as a site for local roads and streets. Raised fill material and a drainage system will reduce wetness. A suitable subgrade or base material will improve soil strength.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. A drainage system around the filter field with diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIe.

CnC—Cazenovia silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained to moderately well drained. It is on the sides of hills. The areas of this soil are generally broad or irregular in shape. They range from 5 to 100 acres. Slopes are generally convex.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, dark brown silt loam

Subsoil:
10 to 15 inches, reddish brown silty clay loam with pink silt and very fine sand as coatings
15 to 34 inches, dark brown silty clay loam with reddish brown clay films

Substratum:
34 to 60 inches, dark reddish gray silty clay loam and 10 percent rock fragments

Included with this soil in mapping are small areas of somewhat poorly drained Ovid soils in shallow depressions and along drainageways. They make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer, moderately slow in the subsoil, and slow in the substratum
Available water capacity: High
Soil reaction: Moderately acid to neutral in the surface layer and subsoil and neutral to moderately alkaline in the substratum
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: 2 to 4 feet (March to May)
Root zone: Unrestricted

Most areas of this soil are in cropland or woodland. A few areas are in pasture.

This soil is moderately suited to cultivated crops. Erosion is the main limitation. Conservation tillage, stripcropping, cover crops, and crop residue in and on the soil help to control erosion. A crop rotation that includes 1 or more years of close-growing crops will also help to control erosion.

This soil is moderately well suited to hay and pasture. Sod crops prevent erosion and reduce soil crusting and clodding. Proper stocking rates, rotation grazing, and weed and brush control help increase the quality and quantity of feed and forage.

The potential productivity for sugar maple on this soil is moderate.

Seasonal wetness is the main limitation of this soil as a site for dwellings with basements. Dwellings without basements are more suitable. Installing interceptor drains that divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. The erosion hazard is severe during construction. Maintaining the plant cover, using temporary erosion control structures during construction, and establishing a plant cover on disturbed areas soon after construction will reduce erosion.

Seasonal wetness, low strength, and slope are the main limitations of the soil as a site for local roads and streets. Raised fill material and a drainage system will reduce wetness. A suitable subgrade or base material will improve soil strength. Constructing roads on the contour will overcome the slope.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. A drainage system around the filter field with diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIe.

CnD—Cazenovia silt loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and well drained or moderately well drained. It is commonly on valley sides and steep areas along drainageways. The areas of this soil are irregular in shape and range from 5 to 50 acres. Slopes are convex or complex.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, dark brown silt loam

Subsoil:
10 to 15 inches, reddish brown silty clay loam with pink silt and very fine sand as coatings
15 to 34 inches, dark brown silty clay loam with reddish brown clay films

Substratum:
34 to 60 inches, dark reddish gray silty clay loam and 10 percent rock fragments

Included with this soil in mapping are Ovid soils in seep spots and in small dissected areas. They make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer, moderately slow in the subsoil, and slow in the substratum
Available water capacity: High
Soil reaction: Moderately acid to neutral in the surface layer and subsoil and neutral to moderately alkaline in the substratum
Surface runoff: Rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: 2 to 4 feet (March to May)
Root zone: Unrestricted

Most areas of this soil are in cropland or woodland. A few areas are in pasture.

This soil is poorly suited to cultivated crops. Slope and the erosion hazard are the main limitations. Conservation tillage, stripcropping, cover crops, and a crop rotation that includes several years of close-growing crops will help to control erosion.

This soil is moderately suited to hay and pasture. Proper stocking rates, rotation grazing, and weed and brush control help increase the quality and quantity of feed and forage.

The potential productivity for sugar maple on this soil is moderate. Erosion is a hazard, and slope limits the use of equipment.

Seasonal wetness and slope are the main limitations of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Building on the contour of the slope will help overcome the slope. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will help reduce wetness. Maintaining the plant cover, using temporary erosion control structures during construction, and establishing a plant cover soon after construction will help control erosion.

Wetness, slope, and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. A drainage system around the filter field and diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent. Placing distribution lines on the contour and using distribution boxes or other similar structures will increase the efficiency of the system on the slope.

The capability subclass is IVe.

CoA—Collamer silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and moderately well drained. The areas are long and narrow and are on interfluves of lacustrine plains. They range from 5 to 20 acres. Slopes are uniform and smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 11 inches, brown silt loam

Subsurface layer:
11 to 17 inches, pale brown and light yellowish brown silt loam with yellowish brown mottles

Subsoil:
17 to 25 inches, yellowish brown and dark yellowish brown silt loam with light brownish gray sand grains as coatings
25 to 47 inches, yellowish brown silt loam with grayish brown mottles

Substratum:
47 to 80 inches, varved light olive brown, yellowish brown, and gray very fine sandy loam, silt loam, and silty clay loam

Included with this soil in mapping are a few small areas of Hudson, Niagara, and Canandaigua soils. The Hudson soils contain more clay than this Collamer soil. The Niagara soils are somewhat poorly drained and are in slightly lower areas, and the Canandaigua soils are poorly drained and very poorly drained and are in drainageways. Inclusions make up about 20 percent of this unit.

Soil properties—

Permeability: Moderate in the surface layer and upper part of the subsoil and moderately slow or slow in the lower part of the subsoil and in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer and the upper part of the subsoil, moderately acid to moderately alkaline in the lower part of the subsoil, and slightly acid to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 2 feet (March to May)
Root zone: Unrestricted

Most areas of this soil are farmed and used for hayland. A few areas are used for cultivated crops in rotation with hay. The other areas are used for pasture or are wooded. This soil is classified as prime farmland.

This soil is well suited to most crops grown in the area. The seasonal high water table delays spring tillage and planting. Interceptor drains and open ditches divert runoff from higher adjacent soils and drain included wet areas, allowing earlier tillage in many fields. Conservation tillage, cover crops, crop residue in and on the soil, and tillage at proper soil moisture content will help maintain tilth and increase organic matter content.

This soil is well suited to pasture. The areas used for pasture are subject to compaction if livestock are allowed to graze while the soil is wet. Compaction destroys soil structure in the surface layer and damages pasture grasses. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer help maintain high quality pastures.

The potential productivity of this soil for sugar maple is moderate. Operating large equipment is difficult while the soil is wet, and timber harvest can be done more easily when the soil is dry or frozen.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

This soil is well suited to recreation facilities such as picnic areas and paths and biking trails. Surface wetness from the high water table and slow permeability limit the suitability for playgrounds or campgrounds and make surface and subsurface drainage necessary in those areas.

The capability subclass is IIw.

CoB—Collamer silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. The areas are broad and long and narrow and are on lacustrine plains. They range from 5 to 25 acres. Slopes are uniform and smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 11 inches, brown silt loam

Subsurface layer:
11 to 17 inches, pale brown and light yellowish brown silt loam with yellowish brown mottles

Subsoil:
17 to 25 inches, yellowish brown and dark yellowish

brown silt loam with light brownish gray sand grains as coatings
25 to 47 inches, yellowish brown silt loam with grayish brown mottles

Substratum:
47 to 80 inches, varved light olive brown, yellowish brown, and gray very fine sandy loam, silt loam, and silty clay loam

Included with this soil in mapping are a few small areas of Hudson, Niagara, and Canandaigua soils. The Hudson soils contain more clay than this Collamer soil. The Niagara soils are somewhat poorly drained and are in slightly lower areas, and the Canandaigua soils are poorly drained and very poorly drained and are in drainageways. Inclusions make up about 20 percent of this unit.

Soil properties—

Permeability: Moderate in the surface layer and upper part of the subsoil and moderately slow or slow in the lower part of the subsoil and in the substratum.
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer and the upper part of the subsoil, moderately acid to moderately alkaline in the lower part of the subsoil, and slightly acid to moderately alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: 1.5 to 2 feet (March to May)
Root zone: Unrestricted

Most areas of this soil are farmed and used for hayland. A few areas are used for cultivated crops in rotation with hay. The other areas are used for pasture or are wooded.

This soil is well suited to most crops grown in the area. The seasonal high water table delays spring tillage and planting. Interceptor drains and open ditches divert runoff water from higher adjacent soils and drain included wet areas. Erosion is a hazard on this soil, especially if cultivated crops are grown at the upper limits of the slope range. Conservation tillage, contour farming, cross-slope tillage, cover crops, field stripcropping, and crop residue in and on the soil help reduce erosion, improve tilth, and increase organic matter content.

This soil is well suited to pasture. Areas used for pasture are subject to compaction if livestock are allowed to graze while the soil is wet. Compaction destroys soil structure in the surface layer and damages pasture plants. Overgrazing also increases erosion. Restricting grazing during wet periods, rotation grazing, and lime and fertilizer help to maintain high quality pasture grasses.

The potential productivity of this soil for sugar maple is moderate. Placing logging roads and trails on the contour helps to control erosion. Operating large equipment is difficult while the soil is wet, and timber harvest can be done more easily when the soil is dry or frozen.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Frost action is the main limitation for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

This soil is well suited to recreation facilities such as picnic areas and paths and biking trails. Surface wetness from the high water table and slow permeability limit the suitability for playgrounds or campgrounds, and make surface and subsurface drainage necessary in those areas.

The capability subclass is IIe.

CoC—Collamer silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and moderately well drained. The areas are broad and long and narrow and are on lacustrine plains. They range from 5 to 25 acres. Slopes are uniform and smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 11 inches, brown silt loam

Subsurface layer:
11 to 17 inches, pale brown and light yellowish brown silt loam with yellowish brown mottles

Subsoil:
17 to 25 inches, yellowish brown and dark yellowish brown silt loam with light brownish gray sand grains as coatings
25 to 47 inches, yellowish brown silt loam with grayish brown mottles

Substratum:
47 to 80 inches, varved light olive brown, yellowish brown, and gray very fine sandy loam, silt loam, and silty clay loam

Included with this soil in mapping are a few small areas of Hudson, Niagara, and Canandaigua soils. The Hudson soils contain more clay than this Collamer soil. The Niagara soils are somewhat poorly drained and are in slightly lower areas, and the Canandaigua soils are poorly drained and very poorly drained and are in drainageways. Inclusions make up about 20 percent of this unit.

Soil properties—

Permeability: Moderate in the surface layer and upper part of the subsoil and moderately slow or slow in the lower part of the subsoil and in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer and the upper part of the subsoil, moderately acid to moderately alkaline in the lower part of the subsoil, and slightly acid to moderately alkaline in the substratum
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: 1.5 to 2 feet (March to May)
Root zone: Unrestricted

Most areas of this soil are farmed and used for hayland. A few areas are used for cultivated crops in rotation with hay. The other areas are used for pasture or are wooded.

This soil is moderately suited to cultivated crops. It is better suited to permanent hayland. Erosion is the major limitation for cultivated crops. A conservation tillage system that leaves crop residue on the surface after planting and stripcropping and contour farming or a crop rotation with 1 or more years of close-growing crops will help to control erosion.

This soil is moderately well suited to pasture. The areas of this soil used for pasture are subject to compaction if livestock are allowed to graze while the soil is wet. Compaction destroys soil structure in the surface layer and damages pasture grasses. Overgrazing increases erosion. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer will help to maintain high quality pasture grasses.

The potential productivity of this soil for sugar maple is moderate. Placing logging roads and trails on the contour helps to control erosion. Operating large equipment is difficult while the soil is wet, and timber harvest can be done more easily when the soil is dry or frozen.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Frost action is the main limitation for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

This soil is well suited to recreation facilities such as picnic areas and paths and biking trails. Surface wetness from the high water table and slow permeability limit the suitability for playgrounds or campgrounds and make surface and subsurface drainage necessary in those areas.

The capability subclass is IIIe.

ElA—Elmridge very fine sandy loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and moderately well drained. It is on broad areas of low lake plains, mainly separating areas of outwash and clayey soils. Most areas range from 5 to 20 acres. Slopes are uniform and smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, dark brown very fine sandy loam

Subsoil:
10 to 17 inches, yellowish brown fine sandy loam
17 to 23 inches, yellowish brown fine sandy loam with light brownish gray mottles

Substratum:
23 to 60 inches, light brownish gray silty clay loam with brown mottles
60 to 80 inches, stratified brown silty clay loam, silt, and clay, and a few thin layers of fine sand

Included with this soil in mapping are small areas of somewhat poorly drained Shaker soils in slightly lower areas and drainageways, Knickerbocker soils where the loamy sediments are thicker than 40 inches over the clayey substratum, and Hudson soils where the loamy sediments are thin or nonexistent. Inclusions make up about 20 percent of this unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and the subsoil and slow or very slow in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to slightly acid in the surface layer and subsoil and moderately acid to mildly alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal water table: 1.5 to 3 feet (November to May)
Root zone: Typically to a depth of 23 inches

Most areas of this soil are farmed, mostly for corn and vegetable crops, and the soil is classified as prime farmland. Some other areas are in hay and pasture or are wooded.

This soil is well suited to most crops grown in the area. The seasonal high water table delays spring tillage and planting. Interceptor drains and open ditches divert runoff from higher adjacent soils and drain included wet areas, allowing earlier tillage in many fields. Conservation tillage, cover crops, crop residue in and on the soil, and tillage at proper soil moisture content will help maintain tilth and increase organic matter content.

This soil is well suited to pasture. The areas used for pasture are subject to compaction if livestock are allowed to graze while the soil is wet. Compaction destroys soil structure in the surface layer and damages pasture grasses. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer help maintain high quality pastures.

The potential productivity of this soil for eastern white pine is very high.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Frost action and low strength are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action and improve soil strength.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

This soil is well suited to recreation facilities such as picnic areas and paths and biking trails. Surface wetness from the high water table and slow permeability limit the suitability for playgrounds or campgrounds and make surface and subsurface drainage necessary in those areas.

The capacity subclass is IIw.

ElB—Elmridge very fine sandy loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. The areas are broad and long and narrow and are on lacustrine terraces between the clayey soils of the lacustrine plain and the sandy soils of the outwash plains and terraces. The areas range from 5 to 25 acres. Slopes are uniform and smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, dark brown very fine sandy loam
10 to 17 inches, yellowish brown fine sandy loam
17 to 23 inches, yellowish brown fine sandy loam with light brownish gray mottles

Substratum:
23 to 60 inches, light brownish gray silty clay loam with brown mottles
60 to 80 inches, stratified brown silty clay loam, silt, and clay, and a few thin layers of fine sand

Included with this soil in mapping are small areas of somewhat poorly drained Shaker soils in slightly lower areas and drainageways, Knickerbocker soils where the loamy sediments are thicker than 40 inches over the clayey substratum, and Hudson soils where the loamy sediments are thin or nonexistent. Inclusions make up about 20 percent of this unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil and slow or very slow in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to slightly acid in the surface layer and subsoil and moderately acid to mildly alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 3 feet (November to May)
Root zone: Typically to a depth of 23 inches

Most areas of this soil are farmed, mostly for corn and vegetable crops, and the soil is classified as prime farmland. Some other areas are in hay and pasture or are wooded.

This soil is well suited to most crops grown in the area. The seasonal high water table delays spring tillage and planting. Interceptor drains and open ditches divert runoff water from higher adjacent soils and drain included wet areas. Erosion is a hazard on this soil, especially if cultivated crops are grown at the upper limits of the slope range. Conservation tillage, contour farming, cross-slope tillage, cover crops, field stripcropping, and crop residue in and on the soil help reduce erosion, improve tilth, and increase organic matter content.

This soil is well suited to pasture. Areas used for pasture are subject to compaction if livestock are allowed to graze while the soil is wet. Compaction destroys soil structure in the surface layer and damages pasture plants. Overgrazing also increases erosion. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer help to maintain high quality pasture grasses.

The potential productivity of this soil for eastern white pine is very high.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Frost action and low strength are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action and improve soil strength.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

This soil is well suited to recreation facilities such as picnic areas and paths and biking trails. Surface wetness from the high water table and slow permeability limit the suitability for playgrounds or campgrounds and make surface and subsurface drainage necessary in those areas.

The capability subclass is IIw.

En—Elnora fine sandy loam. This soil is very deep, nearly level, and moderately well drained. It is on broad, flat areas of sandy beaches or deltas between the lacustrine plains and till plains or more gravelly major outwash plains and terraces. The areas are round or oval and range from 5 to 20 acres. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 10 inches, dark brown, fine sandy loam

Subsoil:
10 to 21 inches, yellowish brown loamy fine sand with faint dark yellowish brown mottles

Substratum:
21 to 28 inches, grayish brown loamy fine sand with dark yellowish brown mottles
28 to 60 inches, grayish brown and dark yellowish brown fine sand

Included with this soil in mapping are small areas of moderately well drained Knickerbocker soils on low

knolls. Also included are small areas of poorly drained and somewhat poorly drained Walpole soils in shallow depressions. The included areas are less than 3 acres each and make up about 15 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and rapid in the subsoil and substratum
Available water capacity: Low
Soil reaction: Very strongly acid to slightly acid in the surface layer and subsoil and strongly acid to neutral in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 2 feet (February to May)
Root zone: Unrestricted

Most areas of this soil are used for crops, mostly corn or vegetable crops. Some areas are used for hay or pasture, and the rest are wooded. This soil is classified as prime farmland.

This soil is moderately suited to most cultivated crops and to hay or pasture. The seasonal high water table in the spring delays tillage and planting of some crops. A system of tile drains will improve the timeliness of tillage, but establishing an outlet for the drains is difficult on this soil and cutbanks cave in easily during installation of tile systems. Conservation tillage, cover crops, crop residue in and on the soil, and crop rotations with sod crops will improve and maintain tilth and increase organic matter content. Some crops on this soil require irrigation during dry periods of the growing season.

This soil is moderately well suited to pasture. The areas used for pasture are subject to compaction if livestock are allowed to graze while the soil is wet. Compaction destroys soil structure in the surface layer and damages pasture grasses. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer help maintain high quality pastures.

The potential productivity of this soil for northern red oak is moderately high. Seedling mortality is severe.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. Raised fill material and a drainage system will reduce wetness. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. Poor filtering causes a hazard of contamination to ground water. The nearby Blasdell soils in areas that are less sandy are better suited to septic tank absorption fields.

Some areas are suitable for recreation facilities such as campsites, picnic areas, and athletic fields.

The capability subclass is IIIw.

FaB—Farmington silt loam, undulating, very rocky. This soil is shallow and well drained to somewhat excessively drained. It is on narrow ridgetops on faulted and folded bedrock-controlled uplands. The areas are long and narrow and oriented north-south. They range from 5 to 15 acres. Rock outcrops cover 2 to 10 percent of the surface. Slopes are complex and range from 1 to 6 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, dark brown silt loam and 10 percent rock fragments

Subsoil:
8 to 16 inches, brown silt loam and 10 percent rock fragments

Bedrock:
16 inches, hard gray limestone

Included with this soil in mapping are a few small areas of well drained Stockbridge soils where the bedrock is at a depth of more than 40 inches. Also included are a few small areas of poorly drained Sun soils in narrow drainageways between ridges and Nassau soils where the limestone bedrock and shale bedrock are interbedded. The inclusions of Stockbridge soils make up about 10 percent of the unit and the Sun and Nassau soils about 5 percent each.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Strongly acid to slightly acid in the surface layer and moderately acid to mildly alkaline in the subsoil
Surface runoff: Slow

Erosion hazard: Slight
Depth to the seasonal high water table: More than 72 inches
Root zone: Restricted by bedrock
Depth to bedrock: 10 to 20 inches

Most areas of this soil are wooded or used for pasture. Only a few areas are used for crops.

This soil is not suited to cultivated crops because of the depth to bedrock, the rock outcrops, and droughtiness. The rock outcrops can hinder tillage. In most years crop yields are low because of moisture stress.

This soil is poorly suited to hay and pasture. Proper stocking rates, rotation grazing, and weed and brush control help increase the quality and quantity of pasture grasses.

The potential productivity for sugar maple on this soil is moderate. Seedling mortality is high, and windthrow is a hazard.

The depth to bedrock is the main limitation of this soil as a site for dwellings with basements. The bedrock is hard limestone and generally is not easily ripped. Building above the bedrock and landscaping with fill will help to overcome the bedrock.

The depth to bedrock is also a limitation of the soil as a site for local roads and streets and for septic tank absorption fields.

The capability subclass is VIs.

FaC—Farmington silt loam, rolling, very rocky. This soil is shallow and well drained to somewhat excessively drained. It is on the sides of narrow ridges on faulted and folded bedrock-controlled uplands. The areas are long and narrow and oriented north-south. They range from 5 to 15 acres. Rock outcrops cover 2 to 10 percent of the surface. Slopes are complex and range from 6 to 16 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, dark brown silt loam and 10 percent rock fragments

Subsoil:
8 to 16 inches, brown silt loam and 10 percent rock fragments

Bedrock:
16 inches, hard gray limestone

Included with this soil in mapping are a few small areas of well drained Stockbridge soils where the bedrock is at a depth of more than 40 inches. Also included are a few small areas of poorly drained Sun soils in narrow drainageways between ridges and Nassau soils where the limestone bedrock and shale bedrock are interbedded. The inclusions of Stockbridge soils make up about 10 percent of the unit and the Sun and Nassau soils about 5 percent each.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Strongly acid to slightly acid in the surface layer and moderately acid to mildly alkaline in the subsoil
Surface runoff: Medium
Erosion hazard: Severe
Depth to the seasonal high water table: More than 72 inches
Root zone: Restricted by bedrock
Depth to bedrock: 10 to 20 inches

Most areas of this soil are wooded or used for pasture.

This soil is not suited to cultivated crops because of the depth to bedrock, the rock outcrops, the slope, and droughtiness. The slope and rock outcrops hinder tillage, and crop yields are low because of droughtiness.

This soil is poorly suited to hay and pasture. Proper stocking rates, rotation grazing, and weed and brush control help increase the quality and quantity of pasture grasses.

The potential productivity for sugar maple on this soil is moderate. Seedling mortality is high, and windthrow is a hazard.

The depth to bedrock is the main limitation of this soil as a site for dwellings with basements. The bedrock is hard limestone and generally is not easily ripped. Building above the bedrock and landscaping with fill will help to overcome the bedrock. Erosion is a severe hazard during construction. Maintaining the plant cover and using temporary erosion control structures during construction will reduce erosion. Establishing a plant cover on disturbed areas soon after construction also controls erosion.

The depth to bedrock is also a limitation of the soil as a site for local roads and streets and for septic tank absorption fields.

The capability subclass is VIs.

FaD—Farmington silt loam, hilly, very rocky. This soil is shallow and well drained to somewhat excessively drained. It is on the sides of steep, narrow, north-south oriented ridges on faulted and folded bedrock-controlled uplands. The areas are long and narrow and range from 5 to 15 acres. Rock outcrops cover 2 to 10 percent of the surface. Slopes are complex and range from 10 to 30 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, dark brown silt loam and 10 percent rock fragments

Subsoil:
8 to 16 inches, brown silt loam and 10 percent rock fragments

Bedrock:
16 inches, hard gray limestone

Included with this soil in mapping are a few small areas of well drained Stockbridge soils where the bedrock is at a depth of more than 40 inches. Also included are a few small areas of poorly drained Sun soils in narrow drainageways between ridges and Nassau soils where the limestone bedrock and shale bedrock are interbedded. The inclusions of Stockbridge soils make up about 10 percent of the unit and the Sun and Nassau soils about 5 percent each.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Strongly acid to slightly acid in the surface layer and moderately acid to mildly alkaline in the subsoil
Surface runoff: Rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: More than 72 inches
Root zone: Restricted by bedrock
Depth to bedrock: 10 to 20 inches

Most areas of this soil are wooded. A few are in pasture.

Because of the slope, bedrock, rock outcrops, and droughtiness, this soil generally is not suited to farming.

The potential productivity for sugar maple on this soil is moderate. Slope, high seedling mortality, and windthrow cause low timber yields, hinder harvesting, and limit the selection of species for reforestation.

The depth to bedrock and the slope are the main limitations of this soil as a site for dwellings, local roads and streets, and septic tank absorption fields.

The capability subclass is VIs.

FdE—Farmington-Rock outcrop complex, steep. This unit consists of somewhat excessively drained to well drained, shallow soils and outcrops of hard dolomitic limestone. It is on abrupt north-south oriented ridges of faulted and folded bedrock-controlled landscapes. The unit is about 65 percent Farmington soils, 15 percent rock outcrops, and 20 percent minor soils. The Farmington soils and rock outcrops are so intermingled that it was not practical to map them separately. The areas of this unit range from 5 to 20 acres. Slopes range from 25 to 35 percent.

The typical sequence, depth, and composition of the layers of the Farmington soils are as follows—

Surface layer:
surface to 8 inches, dark brown silt loam and 10 percent rock fragments

Subsoil:
8 to 16 inches, brown silt loam and 10 percent rock fragments

Bedrock:
limestone

Included with this unit in mapping are a few small areas of very deep, well drained Stockbridge soils, poorly drained Sun soils in narrow drainageways between ridges and in pockets in the rock, and soils with slopes of more than 35 percent.

Properties of the Farmington soils—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Strongly acid to slightly acid in the surface layer and moderately acid to mildly alkaline in the subsoil
Surface runoff: Very rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: More than 72 inches
Root zone: Restricted by bedrock
Depth to bedrock: 10 to 20 inches

Most areas of this complex are wooded.

Slope, depth to bedrock, and rock outcrops make this

soil generally unsuited to farming.

This unit has moderate potential productivity for sugar maple. Slope, depth to bedrock, droughtiness, and rock outcrops limit accessibility and cause high seedling mortality. Windthrow and erosion are hazards and the use of equipment is limited.

The shallow depth to bedrock and the hilly slopes are the main limitations for septic tank absorption fields. Inclusions in this unit and nearby soils, such as Stockbridge soils, that are deeper to bedrock have limitations due to slow percolation but are better suited to septic tank absorption fields.

The capability subclass is VIIs.

Fn—Fluvaquents-Udifluvents complex, frequently flooded. This unit consists of nearly level, very poorly drained to excessively drained soils on flood plains. Most areas are long and narrow and roughly parallel to the stream. They commonly range from 5 to 25 acres, but a few areas are as large as 50 acres. Slopes range from 0 to 3 percent. Fluvaquents make up about 50 percent of this unit, Udifluvents about 40 percent, and other soils about 10 percent. The Fluvaquents and Udifluvents are mapped together because they are so intermingled that it was not practical to map them separately.

The general sequence, depth, and composition of the layers of Fluvaquents are as follows—

Surface layer:
0 to 6 inches, black or very dark brown sandy loam to silt loam and varying amounts of rock fragments

Substratum:
6 to 60 inches, very dark gray, dark olive gray to gray, and light olive gray, mottled sandy loam to silty clay loam and varying amounts of gravel

The general sequence, depth, and composition of the layers of Udifluvents are as follows—

Surface layer:
0 to 9 inches, gray and very dark gray to yellowish brown and olive silt loam to sand and varying amounts of gravel

Substratum:
9 to 60 inches, dark gray and gray to dark yellowish brown and olive sandy loam to silty clay loam and varying amounts of gravel

Included with this unit in mapping are areas of Occum, Linlithgo, and Limerick soils that are not frequently flooded and small areas of Blasdell soils on alluvial fans. The included soils are in areas as large as 2 acres.

Properties of Fluvaquents—

Permeability: Very rapid to slow
Available water capacity: High to low
Soil reaction: Strongly acid to mildly alkaline
Surface runoff: Slow
Erosion hazard: Moderate (streambank)
Depth to the seasonal high water table: At the surface (April to June)
Flooding: Frequent (April to June and September to December)

Properties of Udifluvents—

Permeability: Very rapid to slow
Available water capacity: High to low
Soil reaction: Very strongly acid to mildly alkaline
Surface runoff: Slow
Erosion hazard: Moderate (streambank)
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically unrestricted
Flooding: Frequent (April to June and September to December)

Most areas of this unit are in brushland or water-tolerant woodland. A few areas are pasture.

The variability of soil properties, such as texture, gravel content, and drainage, and the frequency of flooding usually make this unit unsuitable for cultivated crops, recreation, community development, and timber production. Some areas provide pasture, but generally the quality is poor. Overgrazing and grazing near streambanks increase erosion. Areas of Fluvaquents commonly provide a suitable habitat for wetland wildlife.

The capability subclass is Vw.

Fr—Fredon silt loam. This soil is very deep, nearly level, and somewhat poorly drained to poorly drained. It is on outwash plains and valley floors. The areas generally are long and narrow, oval, or round and range from 5 to 25 acres. Slopes are smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 7 inches, very dark grayish brown silt loam

Subsoil:
7 to 32 inches, dark grayish brown gravelly fine sandy loam with light olive brown, dark reddish brown, olive, and dark yellowish brown mottles

Substratum:
32 to 40 inches, dark grayish brown very gravelly loamy fine sand
40 to 60 inches, dark grayish brown very gravelly loamy sand

Included with this soil in mapping are a few small areas of moderately well drained Castile soils on slightly convex positions in the landscape. Also included are a few small areas of very poorly drained Halsey soils in shallow depressions. Inclusions make up about 15 percent of this unit.

Soil properties—

Permeability: Moderate in the surface layer, moderately slow to moderate in the subsoil, and rapid in the substratum
Available water capacity: Moderate
Soil reaction: Moderately acid to neutral in the surface layer and subsoil and slightly acid to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: Surface to 1.5 feet (October to June)
Root zone: Typically to a depth of about 32 inches

Most areas of this soil are used for crops or are wooded. A few areas are used for pasture. This soil, where drained, is classified as prime farmland.

Seasonal wetness is the main limitation of the soil for cultivated crops. Where drained, the soil is suited to most types of crops including corn and hay. Tile drains are suitable, but this soil is in low positions on the landscape and suitable outlets are hard to establish. Gravel fragments hinder some tillage and harvest operations. Conservation tillage, cover crops, and crop rotations improve tilth and increase yields.

This soil is well suited to hay and pasture. Grazing during wet periods damages the soil and the pasture grasses. Proper stocking rates, rotation grazing, weed and brush control, and lime and fertilization will improve the quality and quantity of forage.

The potential productivity for northern red oak on this soil is moderate. Seasonal wetness restricts rooting and results in high seedling mortality and windthrow. Seasonal wetness also limits the use of equipment.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading the land so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. The poor filtering causes a hazard of contamination to ground water.

The capability subclass is IIIw.

GaA—Georgia silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and moderately well drained. It is on hilltops or tops of drumlins or in areas between till uplands and adjacent outwash, lacustrine, or alluvial areas. The areas are broad and commonly oval and range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 20 inches, dark yellowish brown channery silt loam
20 to 32 inches, light olive brown channery silt loam with yellowish brown and dark grayish brown mottles

Substratum:
32 to 60 inches, olive channery loam with yellowish brown mottles

Included with this soil in mapping are small areas of well drained Stockbridge soils, somewhat poorly drained and poorly drained Massena soils, and very poorly drained Sun soils. The Stockbridge soils are on slightly higher spots, the Massena soils are in low, slightly concave areas, and the Sun soils commonly are in narrow drainageways. Included soils make up about 20 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and the

subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral throughout
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 3 feet (November to May)
Root zone: Unrestricted

Most areas of this soil are farmed. The other areas are in woodland or brushland. This soil is classified as prime farmland.

The soil is well suited to most cultivated crops and to hay or pasture. The seasonal high water table sometimes delays spring plowing and planting for row crops. Tile drainage is commonly used to reduce wetness. Diversions or interceptor drains that divert runoff from adjacent uplands will help reduce wetness. Conservation tillage, cover crops, and crop residue in and on the soil increase organic matter content and improve tilth. Crop rotation systems and conservation tillage help to control erosion.

This soil is well suited to pasture. Grazing when the soil is wet causes compaction and destroys favorable grasses. Proper stocking rates, rotation grazing, and limited use during wet periods extend the life of the pasture.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIw.

GaB—Georgia silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. It is on broad hilltops, on tops of drumlins, and on gradual south-facing slopes of hills and drumlins. The areas are oval or long and narrow and range from 10 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 20 inches, dark yellowish brown channery silt loam
20 to 32 inches, light olive brown channery silt loam with yellowish brown and dark grayish brown mottles

Substratum:
32 to 60 inches, olive channery loam with yellowish brown mottles

Included with this soil in mapping are small areas of well drained Stockbridge soils, somewhat poorly drained and poorly drained Massena soils, and very poorly drained Sun soils. The Stockbridge soils are on slightly higher spots, the Massena soils are in low, slightly concave areas, and the Sun soils commonly are in narrow drainageways. Included soils make up about 20 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and the subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral throughout
Surface runoff: Medium
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 3 feet (November to May)
Root zone: Unrestricted

Most areas of this soil are farmed. This soil is classified as prime farmland.

This soil is well suited to most crops grown in the area. The seasonal high water table delays spring tillage and planting. Interceptor drains and open ditches divert runoff water from higher adjacent soils and drain included wet areas. Erosion is a hazard on this soil, especially if cultivated crops are grown at the upper limits of the slope range. Conservation tillage, contour farming, cross-slope tillage, cover crops, field stripcropping, and crop residue in and on the soil help reduce erosion, improve tilth, and increase organic matter content.

This soil is well suited to pasture. Areas used for pasture are subject to compaction if livestock are allowed to graze while the soil is wet. Compaction destroys soil structure in the surface layer and damages pasture plants. Overgrazing also increases erosion. Restricting grazing during wet periods, rotation grazing, and lime and fertilizer help to maintain high quality pasture grasses.

The potential productivity for sugar maple on this soil is moderate.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Frost action is the main limitation for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIe.

GaC—Georgia silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and moderately well drained. It is on hillsides and side slopes of drumlins between till uplands and adjacent outwash, lacustrine, or alluvial areas. The areas are generally long and narrow and oriented north-south. They range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 20 inches, dark yellowish brown channery silt loam
20 to 32 inches, light olive brown channery silt loam with yellowish brown and dark grayish brown mottles

Substratum:
32 to 60 inches, olive channery loam with yellowish brown mottles

Included with this soil in mapping are small areas of well drained Stockbridge soils, somewhat poorly drained and poorly drained Massena soils, and very poorly drained Sun soils. The Stockbridge soils are on slightly higher spots, the Massena soils are in low, slightly concave areas, and the Sun soils commonly are in narrow drainageways. Included soils make up about 20 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and moderately slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral throughout
Surface runoff: Rapid
Erosion hazard: Moderate
Depth to the seasonal high water table: 1.5 to 3 feet (November to May)
Root zone: Unrestricted

Most areas of this soil are farmed. The other areas are woodland or brushland.

This soil is moderately suited to cultivated crops. It is better suited to permanent hayland. Erosion is the major limitation for cultivated crops. A conservation tillage system that leaves crop residue on the surface after planting and stripcropping and contour farming or a crop rotation with 1 or more years of close-growing crops will help to control erosion.

This soil is moderately well suited to pasture. The areas of this soil used for pasture are subject to compaction if livestock are allowed to graze while the soil is wet. Compaction destroys soil structure in the surface layer and damages pasture grasses. Overgrazing increases erosion. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer will help to maintain high quality grasses.

The potential productivity for sugar maple on this soil is moderate. Logging trails on the contour help to prevent gully erosion.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIe.

Ha—Halsey mucky silt loam. This soil is very deep, nearly level, and very poorly drained. It is along drainageways and in depressions. The areas are long and narrow or somewhat oval. They range from 5 to 25 acres. Slopes are generally smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark yellowish brown mucky silt loam

Subsoil:
6 to 23 inches, gray loam with yellowish brown mottles

Substratum:
23 to 60 inches, light olive gray stratified sand and gravel with light olive brown mottles

Included with this soil in mapping are small areas of poorly drained to somewhat poorly drained Fredon soils on slightly higher positions on the landscape. These areas make up about 10 percent of the unit. Also included are small areas of Palms soils in marshes that make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer, moderate to moderately rapid in the subsoil, and rapid in the substratum
Available water capacity: Moderate
Surface runoff: Slow to ponded
Erosion hazard: Slight
Depth to the seasonal high water table: Surface to 6 inches (September to June)
Root zone: Typically to a depth of 23 inches

Most areas of this soil are undrained and are wooded or covered by sedges and water-tolerant brush and alders.

Prolonged wetness and ponding make this soil generally unsuited to cultivated crops and poorly suited to pasture and hay. Grazing when the soil is too wet will destroy the structure of the soil and damage desirable pasture grasses. Rotation grazing, proper stocking rates, and brush control improve the quality of the pasture.

The potential productivity for red maple on this soil is moderate. The prolonged wetness and ponding restrict the use of equipment and cause high seedling mortality. Rooting is restricted by the seasonal high water table, and trees are uprooted during windy periods.

Wetness is the main limitation of the soil as a site for dwellings with basements. Wetness and frost action are the main limitations for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action, and fill material and a drainage system will reduce wetness.

Wetness and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. Contamination of ground water is a hazard because of poor filtering.

The capability subclass is Vw.

HoA—Hoosic gravelly sandy loam, 0 to 3 percent slopes. This soil is deep, nearly level, and somewhat excessively drained. It is on broad, flat valley floors. Gravelly or cobbly rock fragments are commonly on the surface. The areas are rectangular or are irregularly shaped and range from 10 to 100 acres. Slopes are smooth and uniform.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown gravelly sandy loam

Subsoil:
8 to 15 inches, yellowish brown very gravelly sandy loam

Substratum:
15 to 19 inches, yellowish brown very gravelly loamy sand
19 to 37 inches, dark yellowish brown very gravelly loamy sand
37 to 60 inches, dark grayish brown and very dark grayish brown very gravelly sand

Included with this soil in mapping are small areas of well drained Blasdell soils and somewhat excessively drained Knickerbocker soils. The Knickerbocker soils are mainly in transitional areas near finer textured soils.

The Blasdell soils are in areas where rock fragments in the soil are dominantly shale. Also included are areas of moderately well drained Castile soils in slightly lower areas and somewhat poorly drained and poorly drained Fredon soils in small drainageways and depressions. Inclusions make up about 25 percent of the unit.

Soil properties—

Permeability: Rapid to moderately rapid in the surface layer and subsoil, very rapid in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid in the surface layer and subsoil, very strongly acid to moderately acid in the substratum
Erosion hazard: Very slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are farmed. Cultivated crops and specialty crops are grown where irrigation water is available. A few large areas are used for orchards. The other areas are wooded or are mined for sand and gravel.

If irrigated, the soil is well suited to corn, sweet corn, potatoes, and strawberries. If the soil is not irrigated, the suitability for those crops is limited by moisture stress during the growing season. Large stones and cobbles on the surface of some areas interfere with the use of some tillage implements and harvest machinery. Crop residue in and on the soil and heavy applications of manure help to build up the organic matter content, thus increasing water-holding capacity, improving soil structure, and controlling erosion.

In several parts of the county large areas of this soil are used for apple orchards. Transplanted trees do well after an initial establishing period, especially if the soil is irrigated.

This soil is moderately well suited to pasture, but the lack of available moisture for pasture grasses is a limitation. Lime and fertilizer, rotation grazing, and proper stocking rates help protect the pasture grasses.

The potential productivity of this soil for northern red oak is moderately high. The stones on the surface limit machine planting of seedlings.

This soil has few or no limitations as a site for dwellings with basements and for local roads and streets. Poor filtering is the main limitation for septic tank absorption fields. It causes a hazard of groundwater pollution from absorption fields.

Some areas of this soil are suitable for recreation facilities such as campgrounds, playgrounds, and athletic fields if surface stones are removed.

The capability subclass is IIIs.

HoB—Hoosic gravelly sandy loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and somewhat excessively drained. It is on broad valley floors. Large amounts of gravelly or cobbly rock fragments are on the surface. The areas are rectangular or are irregularly shaped and range from 5 to 50 acres. Slopes are smooth and uniform.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown gravelly sandy loam

Subsoil:
8 to 15 inches, yellowish brown very gravelly sandy loam

Substratum:
15 to 19 inches, yellowish brown very gravelly loamy sand
19 to 37 inches, dark yellowish brown very gravelly loamy sand
37 to 60 inches, dark grayish brown and very dark grayish brown very gravelly sand

Included with this soil in mapping are small areas of well drained Blasdell soils and somewhat excessively drained Knickerbocker soils. The Knickerbocker soils are mainly in transitional areas near finer textured soils. The Blasdell soils are in areas where rock fragments in the soil are dominantly shale. Also included are areas of moderately well drained Castile soils in slightly lower areas and somewhat poorly drained and poorly drained Fredon soils in small drainageways and depressions. Inclusions make up about 25 percent of the unit.

Soil properties—

Permeability: Rapid to moderately rapid in the surface layer and subsoil, very rapid in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid in the surface layer and subsoil, very strongly acid to moderately acid in the substratum
Erosion hazard: Slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are farmed. Cultivated crops and specialty crops are grown where irrigation water is

available. A few large areas are used for orchards. The other areas are wooded or are mined for sand and gravel.

If irrigated, the soil is well suited to corn, sweet corn, potatoes, and strawberries. If the soil is not irrigated, the suitability for those crops is limited by moisture stress during the growing season. Large stones and cobbles on the surface of some areas interfere with the use of some tillage implements and harvest machinery. Erosion is a hazard on this soil, particularly at the upper limits of the slope range and adjacent terraces and on the more sloping acres. Crop residue in and on the soil and heavy applications of manure help build up the organic matter content, improve the water-holding capacity and soil structure, and reduce erosion.

In several parts of the county large areas of this soil are used for apple orchards. Transplanted trees do well after an initial establishing period, especially if the soil is irrigated.

This soil is moderately well suited to pasture, but the lack of available moisture for pasture grasses is a limitation. Lime and fertilizer, rotation grazing, and proper stocking rates help protect the pasture grasses.

The potential productivity of this soil for northern red oak is moderately high. The stones on the surface limit machine planting of seedlings.

This soil has few or no limitations as a site for dwellings with basements and for local roads and streets. Poor filtering is the main limitation for septic tank absorption fields. It causes a hazard of groundwater pollution from absorption fields.

Some areas of this soil are suitable for recreation facilities such as campgrounds, playgrounds, and athletic fields if surface stones are removed.

The capability subclass is IIIs.

HoC—Hoosic gravelly sandy loam, rolling. This soil is very deep and somewhat excessively drained. It is on knobs and knolls of gravelly outwash plains. The areas are irregularly shaped and range from 5 to 50 acres. Slopes are complex and range from 6 to 16 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown gravelly sandy loam

Subsoil:
8 to 15 inches, yellowish brown very gravelly sandy loam

Substratum:
15 to 19 inches, yellowish brown very gravelly loamy sand
19 to 37 inches, dark yellowish brown very gravelly loamy sand
37 to 60 inches, dark grayish brown and very dark grayish brown very gravelly sand

Included with this soil in mapping are small areas of well drained, channery Blasdell soils dominated by shale and Palms and Carlisle soils in kettle holes. Inclusions make up about 20 percent of the unit.

Soil properties—

Permeability: Rapid to moderately rapid in the surface layer and subsoil, very rapid in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid in the surface layer and subsoil, very strongly acid to moderately acid in the substratum
Erosion hazard: Slight to moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are farmed. Hay and pasture are the common uses because of the irregularity of the terrain. A few areas are used for apple orchards. The other areas are wooded or mined for sand and gravel.

Heavy applications of lime and fertilizer will make this soil suitable for hay, but moisture stress is a limitation during the growing season of some years. Large stones and cobbles on the surface of some areas interfere with the use of some tillage and harvest equipment. Erosion is a hazard on short, steep slopes. Crop residue in and on the soil and heavy applications of manure build up the organic matter content, improve soil structure, and help control erosion.

In several parts of the county large areas of this soil are used for apple orchards. Transplanted trees do well after an initial establishing period, especially if the soil is irrigated.

This soil is moderately well suited to pasture, but the lack of available moisture for pasture grasses is a limitation. Lime and fertilizer, rotation grazing, and proper stocking rates help protect the pasture grasses.

The potential productivity of this soil for northern red oak is moderately high. The stones on the surface limit machine planting of seedlings.

Slope is the main limitation of this soil as a site for dwellings with basements and for local roads and

streets. Grading and shaping the slopes or designing the dwellings and roads to conform to the natural slope of the land will help overcome the slope.

Poor filtering is the main limitation of the soil as a site for septic tank absorption fields. Contamination of ground water is a hazard because of poor filtering.

Some areas of this soil are suitable for recreation facilities such as campgrounds, playgrounds, and athletic fields if surface stones are removed.

Reclamation of the areas of this soil mined for sand and gravel will help prevent erosion.

The capability subclass is IIIe.

HoD—Hoosic gravelly sandy loam, hilly. This soil is very deep and somewhat excessively drained. It is on long, narrow ridges and on short, steep slopes mainly adjacent to flood plains. The areas of this soil are long and narrow, and some are winding. They range from 5 to 30 acres. Slopes are complex and irregular and range from 15 to 30 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, dark brown gravelly sandy loam

Subsoil:
8 to 15 inches, yellowish brown very gravelly sandy loam

Substratum:
15 to 19 inches, yellowish brown very gravelly loamy sand
19 to 37 inches, dark yellowish brown very gravelly loamy sand
37 to 60 inches, dark grayish brown and very dark grayish brown very gravelly sand

Included with this soil in mapping are small areas of well drained, channery Blasdell soils dominated by shale and Palms and Carlisle soils in kettle holes. Inclusions make up about 20 percent of the unit.

Soil properties—

Permeability: Rapid to moderately rapid in the surface layer and subsoil, very rapid in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid in the surface layer and subsoil, very strongly acid to moderately acid in the substratum
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are mined for sand and gravel. The other areas are wooded.

This soil is poorly suited for cultivated crops. The operation of farm equipment on the steep, irregular slopes is difficult, and moisture stress and erosion are limitations. A crop rotation that includes several years of close-growing crops and conservation tillage will reduce erosion. Crop residue on and in the soil and regular additions of organic material to the soil will increase infiltration and water-holding capacity.

This soil is moderately suited to pasture. Droughtiness, slope, and erosion are limitations. Restricted grazing during dry periods will help maintain forage quality.

The potential productivity of this soil for northern red oak is moderately high. The short, steep slopes make operation of harvest equipment difficult and result in accelerated erosion along access roads and log trails. Placing roads and trails on the contour helps to reduce erosion.

The main limitation of the soil as a site for dwellings with basements is slope. Designing the dwelling to conform to the natural slope or land shaping and grading will help overcome the slope. Maintaining the plant cover at construction sites and using temporary control structures will help reduce erosion. Establishing a plant cover soon after construction also helps to control erosion.

The main limitation of the soil as a site for local roads and streets is slope. Constructing roads and streets on the contour or land shaping and grading will help overcome the slope.

Slope and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. Poor filtering causes a hazard of contamination to ground water.

Reclamation of the areas of this soil mined for sand and gravel will help prevent erosion.

The capacity subclass is IVe.

HpE—Hoosic and Blasdell soils, steep. This unit consists of very deep, somewhat excessively drained and well drained soils on side slopes mainly adjacent to flood plains. The areas are long and narrow and range from 5 to 40 acres. Some areas consist mostly of Hoosic soils, some mostly of Blasdell soils, and some of both. The Hoosic and Blasdell soils were mapped together because of their similarity in use and management. The total acreage of this unit is about 50 percent Hoosic soils, 35 percent Blasdell soils, and 15

percent other soils. Slopes are complex and range from 25 to 35 percent.

The typical sequence, depth, and composition of the layers of the Hoosic soils are as follows—

Surface layer:
surface to 8 inches, dark brown gravelly sandy loam

Subsoil:
8 to 15 inches, yellowish brown very gravelly sandy loam

Substratum:
15 to 19 inches, yellowish brown very gravelly loamy sand
19 to 37 inches, dark yellowish brown very gravelly loamy sand
37 to 60 inches, dark grayish brown and very dark grayish brown very gravelly sand

The typical sequence, depth, and composition of the layers of the Blasdell soils are as follows—

Surface layer:
surface to 10 inches, brown channery loam

Subsoil:
10 to 20 inches, yellowish brown channery loam
20 to 30 inches, dark yellowish brown very channery loam

Substratum:
30 to 40 inches, dark yellowish brown extremely channery loam
40 to 60 inches, dark brown extremely channery silt loam

Included with this unit in mapping are a few small areas of somewhat excessively drained Knickerbocker soils in transition areas near finer textured lacustrine soils. A few rock outcrops are indicated by a symbol on the map.

Properties of the Hoosic soils—

Permeability: Rapid to moderately rapid in the surface layer and subsoil, very rapid in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid in the surface layer and subsoil, very strongly acid to moderately acid in the substratum
Surface runoff: Rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Properties of the Blasdell soils—

Permeability: Moderately rapid throughout
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil, strongly acid to slightly acid in the substratum
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of these soils are brushy or wooded. Some areas are severely eroded and undercut, and other areas are mined for sand and gravel.

The abrupt, steep slopes and the erosion hazard make this unit generally unsuited to cropland. Exposed areas will erode, undercut, and collapse unless stabilized with trees or other plant cover. While this soil is better suited for permanent pasture, the suitability is poor.

The potential productivity of this unit for northern red oak is moderately high. The slopes make operation of harvest equipment difficult. Constructing access roads, logging trails, and other roads on the contour or across the slope will reduce erosion.

Slope is the main limitation of the unit as a site for dwellings with basements and for local roads and streets.

Slope and poor filtering are the main limitations of the unit as a site for septic tank absorption fields. Poor filtering causes a hazard of contamination to ground water.

Reclamation of the areas that are mined for sand and gravel will help prevent erosion.

The capability subclass is VIe.

HvA—Hudson and Vergennes soils, 0 to 3 percent slopes. This unit consists of very deep, nearly level, moderately well drained soils in long, narrow areas between deep gullies. Slopes are smooth and uniform. The areas range from 5 to 20 acres. Some areas consist mostly of Hudson soils, some mostly of Vergennes soils, and some of both. The Hudson and Vergennes soils were mapped together because of similarities in use and management. The total acreage of the unit is about 50 percent Hudson soils, 40 percent Vergennes soils, and 10 percent other soils.

The typical sequence, depth, and composition of the layers of the Hudson soils are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam

Subsurface layer:
6 to 10 inches, brown silt loam

Subsoil:
10 to 15 inches, dark brown silty clay loam with light gray coatings and faint yellowish brown mottles
15 to 26 inches, dark brown silty clay loam with reddish brown and light brownish gray mottles

Substratum:
26 to 45 inches, dark brown and gray layers of silty clay loam
45 to 60 inches, dark brown and gray layers of silty clay

The typical sequence, depth, and composition of the layers of the Vergennes soils are as follows—

Surface layer:
surface to 9 inches, brown silty clay loam

Subsurface layer:
9 to 12 inches, brown silty clay with brown mottles

Subsoil:
12 to 15 inches, brown clay with pinkish gray coatings and strong brown and light brownish gray mottles
15 to 26 inches, dark brown clay with light brownish gray mottles
26 to 29 inches, dark brown clay

Substratum:
29 to 60 inches, brown, yellowish brown, light gray, and reddish brown clay and silty clay

Included with this unit in mapping are a few small slightly lower areas of somewhat poorly drained Kingsbury and Rhinebeck soils and small pockets or narrow drainageways of very poorly drained Livingston and Madalin soils.

Properties of the Hudson soils—

Permeability: Slow or very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, subsurface layer, and subsoil; strongly acid to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 2 feet (November to April)
Root zone: Typically to a depth of at least 26 inches
Shrink-swell potential: Moderate

Properties of the Vergennes soils—

Permeability: Very slow
Available water capacity: High
Soil reaction: Very strongly acid to neutral in the surface and subsurface layers, moderately acid to moderately alkaline in the subsoil, and neutral to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1 to 3 feet (December to May)
Root zone: Typically to a depth of 29 inches
Shrink-swell potential: Moderate

Most areas of this unit are used for hay. A few areas are used for cultivated crops, mostly rotations of corn and hay. The other areas are wooded or used for pasture.

The soils in this unit are well suited to crops and hay. The permeability, the clayey texture, and the water table are the main limitations for farming. The perched water table and the permeability cause the soil to warm slowly in the spring and make early tillage difficult. Tillage of the soil while it is wet will damage the soil structure and result in a hard, cloddy seedbed or a crusty surface when the soil dries. Surface drainage will reduce wetness. Conservation tillage and crop residue on and in the soil improve soil structure and reduce the damage from tillage.

This unit is also well suited to pasture. Grazing when the soils are wet causes compaction, which destroys soil structure and damages pasture grasses. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer help to maintain high quality pasture grasses.

The potential productivity of this unit for northern red oak is moderately high. On Vergennes soils, seedling mortality is severe and the clayey texture limits the use of equipment. Harvesting when the soil is dry or frozen will reduce damage to the soil.

Wetness is the main limitation of the unit as a site for dwellings with basements. The unit is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Frost action and low strength are limitations of the unit as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action and improve soil strength.

Wetness and slow percolation are the main limitations of the unit as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The unit is suitable for such recreation facilities as picnic areas and paths and trails. Playgrounds and athletic fields are only moderately suited because of the slow permeability rates and clayey surface texture.

The capability subclass is IIw.

HvB—Hudson and Vergennes soils, 3 to 8 percent slopes. This unit consists of very deep, gently sloping, moderately well drained soils on plateaus and interfluves between deep gullies on lowlands along the Hudson River. Slopes are smooth and uniform. The areas are long and narrow or rectangular and range from 5 to 100 acres. Some areas consist mostly of Hudson soils, some mostly of Vergennes soils, and some of both. The Hudson and Vergennes soils were mapped together because of similarities in use and management. The total acreage of the unit is about 50 percent Hudson soils, 40 percent Vergennes soils, and 10 percent other soils.

The typical sequence, depth, and composition of the layers of the Hudson soils are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam

Subsurface layer:
6 to 10 inches, brown silt loam

Subsoil:
10 to 15 inches, dark brown silty clay loam with light gray coatings and faint yellowish brown mottles
15 to 26 inches, dark brown silty clay loam with reddish brown and light brownish gray mottles

Substratum:
26 to 45 inches, dark brown and gray layers of silty clay loam
45 to 60 inches, dark brown and gray layers of silty clay

The typical sequence, depth, and composition of the layers of the Vergennes soils are as follows—

Surface layer:
surface to 9 inches, brown silty clay loam

Subsurface layer:
9 to 12 inches, brown silty clay with brown mottles

Subsoil:
12 to 15 inches, brown clay with pinkish gray coatings and strong brown and light brownish gray mottles
15 to 26 inches, dark brown clay with light brownish gray mottles
26 to 29 inches, dark brown clay

Substratum:
29 to 60 inches, brown, yellowish brown, light gray, and reddish brown clay and silty clay

Included with this unit in mapping are a few small slightly lower areas of somewhat poorly drained Kingsbury and Rhinebeck soils and small pockets or narrow drainageways of very poorly drained Livingston and Madalin soils.

Properties of the Hudson soils—

Permeability: Slow or very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, subsurface layer, and subsoil; strongly acid to moderately alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: 1.5 to 2 feet (November to April)
Root zone: Typically to a depth of at least 26 inches
Shrink-swell potential: Moderate

Properties of the Vergennes soils—

Permeability: Very slow
Available water capacity: High
Soil reaction: Very strongly acid to neutral in the surface and subsurface layers, moderately acid to moderately alkaline in the subsoil, and neutral to moderately alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: 1 to 3 feet (December to May)

Root zone: Typically to a depth of 29 inches
Shrink-swell potential: Moderate

Most areas of this unit are used for hay. A few areas are used for cultivated crops, mostly rotations of corn and hay. The other areas are wooded or used for pasture.

The soils in this unit are well suited to crops and hay. The permeability, the clayey texture, and the water table are the main limitations for farming. Erosion is a hazard, particularly at the upper limits of the slope range or along drainageways where gullies form. A conservation tillage system that leaves crop residue on the surface after planting and contour farming or stripcropping will help control erosion. The water table and the permeability make the soil too wet and too cold in the spring for early cultivation and planting. The clayey texture hinders tillage, and tilth is damaged if the soil is worked while wet. Surface drainage will reduce wetness.

This unit is well suited to pasture. Grazing when the soil is wet causes compaction, which destroys soil structure, damages pasture grasses, and causes erosion. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer help maintain high quality pasture grasses.

The potential productivity of this unit for northern red oak is moderately high. The clayey texture of the Vergennes soils hinders the use of equipment. Harvesting when the soil is dry or frozen reduces damage to the soil.

Wetness is the main limitation of the unit as a site for dwellings with basements. The unit is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Frost action and low strength are limitations of the unit as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action and improve soil strength.

Wetness and slow percolation are the main limitations of the unit as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The included areas of Kingsbury and Rhinebeck soils require drainage. The water table in the included areas of Livingston and Madalin soils make them generally unsuitable as sites for buildings and septic tank absorption fields.

This unit is suitable for such recreation developments as picnic areas and paths and trails. Playgrounds and athletic fields are only moderately suited because of slow permeability and a clayey surface texture.

The capability subclass is IIe.

HvC—Hudson and Vergennes soils, 8 to 15 percent slopes. This unit consists of very deep, strongly sloping, moderately well drained soils mainly on stabilized sides of gullies from the Hudson River to the adjacent lowlands. Slopes are short and smooth. The areas are long and narrow and range from 5 to 20 acres. Some areas consist mostly of Hudson soils, some mostly of Vergennes soils, and some of both. The Hudson and Vergennes soils were mapped together because of similarities in use and management. The total acreage of the unit is about 50 percent Hudson soils, 40 percent Vergennes soils, and 10 percent other soils.

The typical sequence, depth, and composition of the layers of the Hudson soils are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam

Subsurface layer:
6 to 10 inches, brown silt loam

Subsoil layer:
10 to 15 inches, dark brown silty clay loam with light gray coatings and reddish brown and light brownish gray mottles
15 to 26 inches, dark brown silty clay loam with reddish brown and light brownish gray mottles

Substratum:
26 to 45 inches, dark brown and gray layers of silty clay loam
45 to 60 inches, dark brown and gray layers of silty clay

The typical sequence, depth, and composition of the layers of the Vergennes soils are as follows—

Surface layer:
surface to 9 inches, brown silty clay loam

Subsurface layer:
9 to 12 inches, brown silty clay with brown mottles

Subsoil:
12 to 15 inches, brown clay with pinkish gray coatings and strong brown and light brownish gray mottles
15 to 26 inches, dark brown clay with light brownish gray mottles
26 to 29 inches, dark brown clay

Substratum:
29 to 60 inches, brown, yellowish brown, light gray, and reddish brown clay and silty clay

Included with this unit in mapping are a few slightly lower areas of somewhat poorly drained Kingsbury and Rhinebeck soils on slumps and benches that make up about 5 percent of the unit. Also included are very poorly drained Livingston and Madalin soils in narrow drainageways across the slopes. They make up about 5 percent of the unit.

Properties of the Hudson soils—

Permeability: Slow or very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, subsurface layer, and subsoil; strongly acid to moderately alkaline in the substratum
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: 1.5 to 2 feet (November to April)
Root zone: Typically to a depth of at least 26 inches
Shrink-swell potential: Moderate

Properties of the Vergennes soils—

Permeability: Very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface and subsurface layers, moderately acid to moderately alkaline in the subsoil, and neutral to moderately alkaline in the substratum
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: 1 to 3 feet (December to May)
Root zone: Typically to a depth of 29 inches
Shrink-swell potential: Moderate

Most areas of this unit are in hayland, unimproved pasture, or woodland.

This unit is moderately suited to cultivated crops. The seasonal high water table, the erosion hazard, and the clayey texture are the main limitations for crops. A combination of shallow surface ditches and randomly placed subsurface drains with surface inlets will reduce wetness. A conservation tillage system that leaves crop residue on the surface after planting and contour farming and stripcropping or a crop rotation with several years of close-growing crops will help to control erosion. Grading gullied areas for grassed waterways will also help to reduce erosion.

The seasonal high water table and the clayey texture restrict the root growth of some preferred pasture grasses and legumes. Grazing when the soil is too wet causes compaction of the surface, damages the soil structure, and causes erosion along livestock trails up and down the slopes. Deferred grazing, rotation grazing, lime and fertilizer, and grazing at a proper soil moisture content are practices that will increase the quality and quantity of forage.

The potential productivity for northern red oak on this unit is moderately high. The seasonal high water table and the clayey texture are the limitations of the Vergennes soils. The clayey texture and the wetness restrict the use of large equipment and make the soil subject to damage from equipment. Harvesting is easier when the soil is dry or frozen. Damage to the plant cover will accelerate erosion, particularly along logging trails. Constructing access roads and logging trails across slopes will reduce erosion.

Wetness is the main limitation of the unit as a site for dwellings with basements. The unit is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Frost action and low strength are limitations of the unit as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action and improve soil strength.

Wetness and slow percolation are the main limitations of the unit as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The included areas of Kingsbury and Rhinebeck soils require drainage. The water table in the included areas of Livingston and Madalin soils make them generally unsuitable as sites for buildings and septic tank absorption fields.

This soil is suitable for such recreation developments as picnic areas and paths and trails. Playgrounds and athletic fields are only moderately suited because of slow permeability and a clayey surface texture.

The capability subclass is IIIe.

HvD—Hudson and Vergennes soils, hilly. This unit consists of very deep, moderately steep, moderately well drained soils on the sides of drainageways and escarpment faces on lacustrine lowlands. The areas on the escarpment faces are oriented north-south. The areas in drainageways are narrow and oriented east and west in a typical dendritic pattern. The areas of this unit range from 10 to 40 acres. Slopes are complex and range from 10 to 30 percent. Some areas consist mostly of Hudson soils, some mostly of Vergennes soils, and some of both. The Hudson and Vergennes soils are mapped together because of similarities in use and management. The total acreage of the unit is about 50 percent Hudson soils, 40 percent Vergennes soils, and 10 percent other soils.

The typical sequence, depth, and composition of the layers of the Hudson soils are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam

Subsurface layer:
6 to 10 inches, brown silt loam

Subsoil:
10 to 15 inches, dark brown silty clay loam with light gray coatings and faint yellowish brown mottles
15 to 26 inches, dark brown silty clay loam with reddish brown and light brownish gray mottles

Substratum:
26 to 45 inches, dark brown and gray layers of silty clay loam
45 to 60 inches, dark brown and gray layers of silty clay

The typical sequence, depth, and composition of the layers of the Vergennes soils are as follows—

Surface layer:
surface to 9 inches, brown silty clay loam

Subsurface layer:
9 to 12 inches, brown silty clay with brown mottles

Subsoil:
12 to 15 inches, brown clay with pinkish gray coatings and strong brown and light brownish gray mottles
15 to 26 inches, dark brown clay with light brownish gray mottles
26 to 29 inches, dark brown clay

Substratum:
29 to 60 inches, brown, yellowish brown, light gray, and reddish brown clay and silty clay

Included with this unit in mapping are a few small areas of somewhat poorly drained Kingsbury and Rhinebeck soils and very poorly drained Livingston and Madalin soils. The Kingsbury and Rhinebeck soils are in shallow concave areas and slumps along faces of slopes. The Livingston and Madalin soils are in narrow drainageways across faces of slopes and in the bottom of drainageways.

Properties of the Hudson soils—

Permeability: Slow or very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, subsurface layer, and subsoil; strongly acid to moderately alkaline in the substratum
Surface runoff: Very rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: 1.5 to 2 feet (November to April)
Root zone: Typically to a depth of 26 inches
Shrink-swell potential: Moderate

Properties of the Vergennes soils—

Permeability: Very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface and subsurface layers, very strongly acid to moderately alkaline in the subsoil, and neutral to moderately alkaline in the substratum
Surface runoff: Very rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: 1 to 3 feet (December to May)
Root zone: Typically to a depth of 29 inches
Shrink-swell potential: Moderate

Most areas of this unit are in woodland or unimproved pasture.

This unit is poorly suited to cultivated crops. The seasonal high water table, the erosion hazard, the short, uneven slopes and irregular topography, and the clayey texture are the main restrictions. Erosion is especially severe in areas with no permanent sod cover. This erosion damages not only the soil in the unit but, through gullying, also adds to the erosion of adjoining less sloping soils.

This unit is better suited to pasture. Grazing when the soil is wet causes damage to the surface of the soil and causes compaction. Rotation grazing and lime and fertilizer help prolong pasture productivity. Soils at the steeper limits of the slope range will erode rapidly if the plant cover is removed by overgrazing.

The potential productivity for northern red oak on this unit is moderately high. The seasonal high water table and the clayey texture of the Vergennes soils make harvesting with heavy equipment difficult. Damage to the plant cover by logging equipment causes accelerated erosion. Constructing access roads and skid trails across the slope reduces soil erosion. Actively eroding gullies undercut tree roots and result in slides and slumps of large areas of wooded soil.

Wetness and the hilly slopes are the main limitations of the soils as sites for dwellings. Dwellings without basements are more suitable, especially in areas of the Hudson soils. Surface drains around the dwellings, drains around footings and backfilled with sand and gravel, and sealants to the foundation will help to reduce the hazards from seasonal wetness. Land shaping and grading will help overcome the slope. Maintaining the plant cover at construction sites, using temporary erosion-control structures, and establishing a plant cover soon after construction will help reduce erosion.

Frost action, slope, and low strength are limitations of the soils as sites for local roads and streets. Excavating and land shaping will help to overcome the slope.

Wetness, the slopes, the slow percolation are the main limitations of the soils as sites for septic tank absorption fields. A drainage system around the filter field with diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent. Placing distribution lines on the contour and using boxes or other structures to promote even distribution of effluent will increase the efficiency of the system on the hilly slopes.

The capability subclass is IVe.

HvE—Hudson and Vergennes soils, steep. This unit consists of very deep, moderately well drained soils on the sides of deep, eroded gullies and long, narrow escarpments near the Hudson River. The areas range from 5 to 30 acres. Slopes are uniform and smooth and range from 25 to 35 percent. Some areas consist mostly of Hudson soils, some mostly of Vergennes soils, and some of both. The Hudson and Vergennes soils are mapped together because they have no major differences that affect use and management. The total acreage of the unit is about 50 percent Hudson soils, 40 percent Vergennes soils, and 10 percent other soils.

The typical sequence, depth, and composition of the layers of the Hudson soils are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam

Subsurface layer:
6 to 10 inches, brown silt loam

Subsoil:
10 to 15 inches, dark brown silty clay loam with light gray coatings and faint yellowish brown mottles
15 to 26 inches, dark brown silty clay loam with reddish brown and light brownish gray mottles

Substratum:
26 to 45 inches, dark brown and gray layers of silty clay loam
45 to 60 inches, dark brown and gray layers of silty clay

The typical sequence, depth, and composition of the layers of the Vergennes soils are as follows—

Surface layer:
surface to 9 inches, brown silty clay loam

Subsurface layer:
9 to 12 inches, brown silty clay with brown mottles

Subsoil:
12 to 15 inches, brown clay with pinkish gray coatings and strong brown and light brownish gray mottles
15 to 26 inches, dark brown clay with light brownish gray mottles
26 to 29 inches, dark brown clay

Substratum:
29 to 60 inches, brown, yellowish brown, light gray, and reddish brown clay and silty clay

Included with this unit in mapping are a few small

areas of somewhat poorly drained Kingsbury and Rhinebeck soils and very poorly drained Livingston and Madalin soils. The Kingsbury and Rhinebeck soils are in shallow concave areas and slumps along faces of steep slopes. The Livingston and Madalin soils are in narrow drainageways across faces of slopes and in the bottom of drainageways. Also included are areas of Hudson and Vergennes soils with slopes of more than 35 percent.

Properties of the Hudson soils—

Permeability: Slow or very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, subsurface layer, and subsoil; strongly acid to moderately alkaline in the substratum
Surface runoff: Very rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: 1.5 to 2 feet (November to April)
Root zone: Typically to a depth of more than 26 inches
Shrink-swell potential: Moderate

Properties of the Vergennes soils—

Permeability: Very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface and subsurface layers, very strongly acid to moderately alkaline in the subsoil, and neutral to moderately alkaline in the substratum
Surface runoff: Very rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: 1 to 3 feet (December to May)
Root zone: Typically to a depth of 29 inches
Shrink-swell potential: Moderate

Most areas of this unit are wooded.

The soils in this unit are generally unsuited to farming. The steep, uneven slopes and irregular topography, the erosion hazard, and the clay, which is subject to slipping, are the main limitations. Erosion and gullies are common if this unit is cultivated. A permanent sod cover and grass waterways help to prevent gullying.

The potential productivity for northern red oak on these soils is moderately high. The slopes, seasonal high water table, slippage, and clayey texture limit the use of equipment. Erosion is especially severe where harvesting removes the protective plant cover. Actively eroding gullies undercut tree roots and cause mass erosion. Such slides and slumps carry large areas of soil and vegetation into widening gullies.

Wetness and the hilly slopes are the main limitations of the soils as sites for dwellings and recreation. Frost action, slope, and low strength are limitations for local roads and streets. Slope, slow percolation, and wetness are the main limitations for septic tank absorption fields.

The capability subclass is VIe.

KnA—Kingsbury and Rhinebeck soils, 0 to 3 percent slopes. This unit consists of very deep, nearly level, somewhat poorly drained soils on broad, low flatlands adjacent to the Hudson River. Slopes are smooth and uniform. The areas are rectangular and range from 10 to 100 acres. Some areas consist mostly of Kingsbury soils, some mostly of Rhinebeck soils, and some of both. The Kingsbury and Rhinebeck soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 50 percent Kingsbury soils, 40 percent Rhinebeck soils, and 10 percent other soils.

The typical sequence, depth, and composition of the layers of the Kingsbury soils are as follows—

Surface layer:
surface to 9 inches, dark grayish brown silty clay loam

Subsurface layer:
9 to 11 inches, light brownish gray silty clay loam with strong brown and gray mottles

Subsoil:
11 to 29 inches, dark brown clay with strong brown and dark brown mottles

Substratum:
29 to 60 inches, grayish brown and dark grayish brown clay and silt with gray and dark brown mottles

The typical sequence, depth, and composition of the layers of the Rhinebeck soils are as follows—

Surface layer:
surface to 10 inches, dark grayish brown silt loam

Subsurface layer:
10 to 12 inches, light brownish gray silt loam with gray and strong brown mottles

Subsoil:
12 to 19 inches, grayish brown silty clay with strong brown and gray mottles
19 to 29 inches, dark brown silty clay with gray,

strong brown, and dark brown mottles

Substratum:
29 to 50 inches, mottled, grayish brown and dark brown silty clay
50 to 60 inches, varved grayish brown clay and dark brown silt

Included with this unit in mapping are a few small areas of very poorly drained Livingston and Madalin soils in concave areas and drainageways and Hudson and Vergennes soils on slightly higher convex positions.

Properties of the Kingsbury soils—

Permeability: Very slow
Available water capacity: High
Soil reaction: Strongly acid to mildly alkaline in the surface layer, subsurface layer, and subsoil; mildly alkaline to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 6 inches to 1.5 feet (December to May)
Root zone: Typically to a depth of at least 29 inches
Shrink-swell potential: High

Properties of the Rhinebeck soils—

Permeability: Slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface and subsurface layers, strongly acid to mildly alkaline in the subsoil, and slightly acid to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 6 inches to 1.5 feet (January to May)
Root zone: Typically to a depth of 29 inches
Shrink-swell potential: Moderate

Most areas of this unit are used for hay. A few areas are used for cultivated crops, mostly rotations of corn and hay. The other areas are wooded or used for pasture.

The soils in this unit are only moderately suited to crops but are well suited to hay. The permeability, clayey texture, and seasonal high water table are the main limitations. The seasonal high water table and the permeability causes the soil to warm very slowly in the spring, making early tillage difficult. Tillage of the soil while it is wet will damage the soil structure and result in a hard, cloddy seedbed or a crusty surface when the soil dries. A combination of shallow surface ditches and randomly placed subsurface drains with surface inlets will reduce wetness. Conservation tillage and crop residues in and on the soil improve soil structure and help maintain tilth.

Grazing when the soil is wet causes compaction, which destroys soil structure and damages pasture grasses. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer will help to maintain high quality productive pastures.

The potential productivity of this unit for sugar maple is moderate. The main limitations for the use of equipment for timber harvesting are the clayey texture and the seasonal high water table. Harvesting when the soil is frozen reduces damage to the soil from equipment.

Wetness and shrink-swell are the main limitations of the soils as sites for dwellings with basements. Surface drains placed around the foundation and interceptor drains placed upslope to divert runoff from higher areas will help overcome wetness. Drains placed around footings and backfilled with sand and gravel will lower the water table. Applying protective sealants to the foundation will help to reduce the risk of wet basements. Reinforcing footings and foundations and backfilling with sand and gravel will help prevent the damage caused by shrinking and swelling.

Low strength, frost action, and wetness are limitations for local roads and streets. Raised fill of coarse-grained material to frost depth will reduce frost action and wetness and improve soil strength.

Wetness and slow percolation are the main limitations of the unit as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The permeability and clayey texture limit the soils as sites for recreation facilities such as picnic areas, paths, playgrounds, and athletic fields.

The capability subclass is IIIw.

KnB—Kingsbury and Rhinebeck soils, 3 to 8 percent slopes. This unit consists of very deep, gently sloping, somewhat poorly drained soils on broad plateaus and interfluves between deep gullies adjacent to the Hudson River. Slopes are smooth and uniform. The areas are rectangular and range from 10 to 100 acres. Some areas consist mostly of Kingsbury soils,

some mostly of Rhinebeck soils, and some of both. The Kingsbury and Rhinebeck soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 50 percent Kingsbury soils, 40 percent Rhinebeck soils, and 10 percent other soils.

The typical sequence, depth, and composition of the layers of the Kingsbury soils are as follows—

Surface layer:
surface to 9 inches, dark grayish brown silty clay loam

Subsurface layer:
9 to 11 inches, light brownish gray silty clay loam with strong brown and gray mottles

Subsoil:
11 to 29 inches, dark brown clay with strong brown and dark brown mottles

Substratum:
29 to 60 inches, grayish brown and dark grayish brown clay and silt with gray and dark brown mottles

The typical sequence, depth, and composition of the layers of the Rhinebeck soils are as follows—

Surface layer:
surface to 10 inches, dark grayish brown silt loam

Subsurface layer:
10 to 12 inches, light brownish gray silt loam with gray and strong brown mottles

Subsoil:
12 to 19 inches, grayish brown silty clay with strong brown and gray mottles
19 to 29 inches, dark brown silty clay with gray, strong brown, and dark brown mottles

Substratum:
29 to 50 inches, mottled, grayish brown and dark brown clay
50 to 60 inches, varved grayish brown clay and dark brown silt

Included with this unit in mapping are a few small areas of very poorly drained Livingston and Madalin soils in concave areas and drainageways and Hudson and Vergennes soils in slightly higher convex positions.

Properties of the Kingsbury soils—

Permeability: Very slow
Available water capacity: High
Soil reaction: Strongly acid to mildly alkaline in the surface layer, subsurface layer, and subsoil; mildly alkaline to moderately alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: 6 inches to 1.5 feet (December to May)
Root zone: Typically to a depth of at least 29 inches
Shrink-swell potential: High

Properties of the Rhinebeck soils—

Permeability: Slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface and subsurface layers, strongly acid to mildly alkaline in the subsoil, and slightly acid to moderately alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: 6 inches to 1.5 feet (January to May)
Root zone: Typically to a depth of 29 inches
Shrink-swell potential: Moderate

Most areas of this unit are used for hay. A few areas are used for cultivated crops, mostly rotations of corn and hay. The other areas are wooded or used for pasture.

The soils in this unit are only moderately suited to crops but are well suited to hay. The seasonal high water table, the clayey texture, the permeability, and the erosion hazard are the main limitations. The seasonal high water table and the slow permeability cause the soil to warm slowly in the spring and delay spring tillage. Tilling the soil while it is wet will damage soil structure and result in a hard, cloddy seedbed or a crusty surface when the soil dries. A combination of shallow surface ditches and subsurface drains with surface inlets will reduce wetness. Sod buffer zones around fields, especially near areas of steep actively eroding gullies, will help control erosion. Conservation tillage, contour farming, and stripcropping will reduce erosion. Using crop residue and regularly adding organic material will help maintain tilth.

Grazing when the soil is wet causes compaction, which destroys soil structure and damages pasture grasses. Restricted grazing during wet periods, rotation grazing, and lime and fertilizer will help to maintain high quality productive pastures.

The potential productivity of this unit for sugar maple is moderate. The main limitations for the use of equipment for timber harvesting are the clayey texture and the seasonal high water table. Harvesting when the soil is dry or frozen will reduce the damage to the soil by harvesting equipment.

Wetness and shrink-swell are the main limitations of the soils as sites for dwellings with basements. Surface drains placed around the foundation and interceptor drains placed upslope to divert runoff from higher areas will help overcome wetness. Drains placed around footings and backfilled with sand and gravel will lower the water table. Applying protective sealants to the foundation will help to reduce the risk of wet basements. Reinforcing footings and foundations and backfilling with sand and gravel will help prevent the damage caused by shrinking and swelling.

Low strength, frost action, and wetness are limitations for local roads and streets. Raised fill of coarse-grained material to frost depth will reduce frost action and wetness and improve soil strength.

Wetness and slow percolation are the main limitations for conventional septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. Where systems are installed, a drainage system around the filter field, with diversions to intercept runoff from higher areas, will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The permeability and clayey texture limit the soils as sites for recreation facilities such as picnic areas, paths, playgrounds, and athletic fields.

The capability subclass is IIIw.

KrA—Knickerbocker fine sandy loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and somewhat excessively drained. It is on broad valley floors. The areas are rectangular and range from 10 to 60 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 12 inches, dark brown fine sandy loam

Subsoil:
12 to 20 inches, dark yellowish brown fine sandy loam
20 to 35 inches, dark yellowish brown loamy fine sand

Substratum:
35 to 53 inches, olive brown loamy fine sand
53 to 60 inches, dark grayish brown fine sand with dark reddish brown and dark brown mottles

Included with this soil in mapping are a few small areas of gravelly Blasdell and Hoosic soils. Also included in slightly lower areas are moderately well drained Elnora soils and somewhat poorly drained to poorly drained Walpole soils. Inclusions make up about 20 percent of this unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and upper part of the upper subsoil, rapid or very rapid in the lower part of the subsoil and in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid to moderately acid throughout
Surface runoff: Slow
Erosion hazard: Very slight
Root zone: Unrestricted
Depth to the water table: More than 72 inches

Most areas of this soil are used for farmland. The soil is classified as prime farmland. Some large areas are used for residential development.

The soil is well suited to apples, potatoes, corn, and hay. This soil is droughty at times, making irrigation necessary during the growing season. Lime and manure will help to build the organic matter content of the soil. This improves the water-holding capacity and the structure.

This soil is well suited to pasture, but available moisture generally is a limitation. Lime and fertilizer, rotation grazing, and proper stocking rates help extend the life and productivity of pastures.

The potential productivity of this soil for sugar maple is moderate.

This soil has few or no limitations as a site for dwellings with basements or for local roads and streets. The main limitation for septic tank absorption fields is poor filtering. It causes a hazard of ground-water pollution from absorption fields.

This soil is suitable for such recreation facilities as campgrounds, playgrounds, and athletic fields.

The capability subclass is IIs.

KrB—Knickerbocker fine sandy loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and somewhat excessively drained. It is on broad valley

floors and in small areas on low knolls and short side slopes. The areas are rectangular and range from 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 12 inches, dark brown fine sandy loam

Subsoil:
12 to 20 inches, dark yellowish brown fine sandy loam
20 to 35 inches, dark yellowish brown loamy fine sand

Substratum:
35 to 53 inches, olive brown loamy fine sand
53 to 60 inches, dark grayish brown fine sand with dark reddish brown and dark brown mottles

Included with this soil in mapping are a few small areas of gravelly Blasdell and Hoosic soils. Also included in slightly lower areas are moderately well drained Elnora soils and somewhat poorly drained to poorly drained Walpole soils. Included soils make up about 15 to 20 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and upper part of the subsoil, rapid or very rapid in the lower part of the subsoil and in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid to moderately acid throughout
Surface runoff: Slow
Erosion hazard: Slight
Root zone: Unrestricted
Depth to the water table: More than 72 inches

Most areas of this soil are used for farmland. The soil is classified as prime farmland. Some large areas are used for residential development.

This soil is moderately suited to apples, potatoes, corn, and hay. This soil is droughty, and providing irrigation is a management concern during critical times of the growing season. Vegetables and specialty crops, like strawberries, are particularly susceptible to droughtiness and require heavy applications of lime and fertilizer. Crop residue and heavy applications of manure will help to build organic matter content in the soil. This improves the water-holding capacity and the soil structure.

This soil is moderately well suited to pasture, but available moisture generally is a limitation. Lime and fertilizer, rotation grazing, and proper stocking rates help extend the life and productivity of pastures.

The potential productivity of this soil for sugar maple is moderate.

This soil has few or no limitations as a site for dwellings with basements or for local roads and streets. The main limitation for septic tank absorption fields is poor filtering. It causes a hazard of ground-water pollution from absorption fields.

This soil is suitable for such recreation facilities as campgrounds, playgrounds, and athletic fields.

The capability subclass is IIIs.

KrC—Knickerbocker fine sandy loam, rolling. This soil is very deep and somewhat excessively drained. It is on knobs and knolls of sandy outwash. The areas of this soil are irregularly shaped and range from 5 to 50 acres. Slopes are complex and range from 6 to 16 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 12 inches, dark brown fine sandy loam

Subsoil:
12 to 20 inches, dark yellowish brown fine sandy loam
20 to 35 inches, dark yellowish brown loamy fine sand

Substratum:
35 to 53 inches, olive brown loamy fine sand
53 to 60 inches, dark grayish brown fine sand with dark reddish brown and dark brown mottles

Included with this soil in mapping are a few small areas of gravelly Blasdell and Hoosic soils. Also included in slightly lower areas are moderately well drained Elnora soils and somewhat poorly drained to poorly drained Walpole soils. Inclusions make up about 20 percent of this unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and upper part of the subsoil, rapid or very rapid in the lower part of the subsoil and in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid to moderately acid throughout
Surface runoff: Medium

Erosion hazard: Moderate
Root zone: Unrestricted
Depth to the water table: More than 72 inches

Most areas of this soil are in hay and pasture. A few areas are used for apple orchards. The other areas are used for housing or woodland or are mined for sand.

This soil is moderately suited to cultivated crops, but droughtiness during the growing season of some years is a limitation. Erosion is a hazard on short, steep slopes. Crop residue and heavy applications of manure build the organic matter content of the soil and improve water-holding capacity and structure and reduce erosion. Conservation tillage and a crop rotation with grasses and legumes will also reduce erosion.

Areas of this soil in several parts of the county are used for apple orchards. Transplanted trees do well after an initial period of establishment, especially if irrigation water is available.

This soil is moderately well suited to pasture, but available moisture generally is a limitation. Lime and fertilizer, rotation grazing, and proper stocking rates help extend the life and productivity of pastures.

The potential productivity of this soil for sugar maple is moderate. Erosion is a hazard along log skidding roads and access roads. Building roads across the slopes and on the contour will reduce erosion.

Slope is the main limitation of the soil as a site for dwellings with basements and for local roads and streets. Grading and shaping the slopes or designing the dwellings to conform to the natural slope of the land will help overcome the slope. Erosion is a hazard during construction. Maintaining the plant cover and establishing it soon after construction will reduce erosion.

Poor filtering is the main limitation of the soil as a site for septic tank absorption fields. It causes a hazard of contamination to ground water.

This soil is suitable for such recreation facilities as campgrounds and picnic areas if it is reshaped and smoothed.

The capability subclass is IIIe.

KrD—Knickerbocker fine sandy loam, hilly. This soil is very deep and somewhat excessively drained. It is on long, narrow ridges and on short, steep slopes adjacent to flood plains. The areas of this soil are long and narrow, and some are winding. They range from 5 to 30 acres. Slopes are complex and irregular and range from 10 to 30 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 12 inches, dark brown fine sandy loam

Subsoil:
12 to 20 inches, dark yellowish brown fine sandy loam
20 to 35 inches, dark yellowish brown loamy fine sand

Substratum:
35 to 53 inches, olive brown loamy fine sand
53 to 60 inches, dark grayish brown fine sand with dark reddish brown and dark brown mottles

Included with this soil in mapping are a few small areas of gravelly Blasdell and Hoosic soils. Inclusions make up about 15 percent of this unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and upper part of the subsoil, rapid or very rapid in the lower part of the subsoil and in the substratum
Available water capacity: Low
Soil reaction: Very strongly acid to moderately acid throughout
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: More than 72 inches
Root zone: Unrestricted

Most areas of this soil are used for hay and pasture. The other areas are brushland or woodland.

This soil is poorly suited to cultivated crops. Erosion and droughtiness are limitations, and the operation of farm equipment on the steep, irregular slopes is difficult. A crop rotation with several years of grasses and legumes and conservation tillage will reduce erosion. Crop residue and additions of organic material will increase infiltration and the water-holding capacity of the soil.

This soil is moderately suited to pasture. Droughtiness, slope, and erosion are the main limitations. Restricted grazing during dry periods will help to maintain forage quality.

The potential productivity of this soil for sugar maple is moderate. Slopes limit the operation of harvest equipment, and its operation increases erosion along access roads and logging trails. Placing roads and trails across slopes or on the contour helps to reduce erosion.

The main limitation of the soil as a site for dwellings

with basements is slope. Designing the dwelling to conform to the natural slope or land shaping and grading will help overcome the slope. Maintaining the plant cover at construction sites and using temporary control structures will help reduce erosion. Establishing a plant cover soon after construction also helps to control erosion.

The main limitation of the soil as a site for local roads and streets is slope. Constructing roads and streets on the contour or land shaping and grading will help overcome the slope.

Slope and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. The poor filtering causes a hazard of contamination to ground water.

Reclamation of areas of this soil mined for sand helps prevent erosion.

The capability subclass is IVe.

LaE—Lanesboro channery silt loam, steep, stony. This soil is very deep and well drained. It is on the sides of hills and mountains at an elevation of 1,000 feet or more. The areas are irregularly shaped. Stones and boulders about 20 to 80 feet apart are on the surface. The areas range from 20 to 350 acres. Slopes typically are smooth and range from 15 to 35 percent.

The typical sequence, depth, and composition of the layers of this Lanesboro soil are as follows—

Surface layer:
surface to 4 inches, dark brown channery silt loam

Subsoil:
4 to 17 inches, dark yellowish brown channery silt loam with yellowish brown mottles in the lower part
17 to 41 inches, dark grayish brown channery silt loam with olive and yellowish brown streaks

Substratum:
41 to 47 inches, dark grayish brown and light brownish gray channery loam
47 to 60 inches, grayish brown channery loam with dark reddish brown stains

Included with this soil in mapping are small areas of poorly drained Monarda soils and very poorly drained Aurelie soils in drainageways and concave impoundments. Also included are a few small areas of shallow Taconic soils and moderately deep Macomber soils. Inclusions make up about 20 percent of this unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid throughout
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: 1.5 to 2.5 feet (February to April)
Root zone: Typically to a depth of 40 inches

Nearly all areas of this soil are in woodland.

This soil is not suited to cultivated crops and is poorly suited to pasture. Slope, stones on the surface, and erosion are the main limitations. The elevation of the soil limits the length of the growing season.

The potential productivity for northern red oak on this soil is moderate. Slope limits the use of equipment, and rooting is restricted. Placing access roads and log skidding trails on the contour or across slopes helps reduce erosion.

The main limitation of the soil as a site for dwellings with basements is slope. Designing the dwelling to conform to the natural slope or land shaping and grading will help overcome the slope. Maintaining the plant cover at construction sites and using temporary control structures will help reduce erosion. Establishing a plant cover soon after construction also helps to control erosion.

The main limitation of the soil as a site for local roads and streets is slope. Constructing roads and streets on the contour or land shaping and grading will help overcome the slope.

Slow percolation and slope are the main limitations of the soil as a site for septic tank absorption fields.

Slopes restrict this soil for most types of recreation. Some scenic areas are used for hiking or unimproved picnic sites.

The capability subclass is VIs.

LaF—Lanesboro channery silt loam, very steep, stony. This soil is very deep and well drained. It is on the sides of mountains at an elevation of 1,000 feet or more. Stones and boulders on the surface are about 20 to 80 feet apart. The areas are irregularly shaped. They range from 15 to 100 acres. Slopes typically are smooth and range from 35 to 45 percent, but some are as much as 60 percent.

The typical sequence, depth, and composition of the layers of this Lanesboro soil are as follows—

Surface layer:
surface to 4 inches, dark brown channery silt loam

Subsoil:
4 to 17 inches, dark yellowish brown channery silt loam with yellowish brown mottles in the lower part
17 to 41 inches, dark grayish brown channery silt loam with olive and yellowish brown streaks

Substratum:
41 to 47 inches, dark grayish brown and light brownish gray channery loam
47 to 60 inches, grayish brown channery loam with dark reddish brown stains

Included with this soil in mapping are small areas of poorly drained Monarda soils and very poorly drained Aurelie soils in drainageways and concave impoundments. Also included are a few small areas of shallow Taconic soils and moderately deep Macomber soils. Inclusions make up about 20 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid throughout
Surface runoff: Very rapid
Erosion hazard: Very severe
Depth to the seasonal high water table: 1.5 to 2.5 feet (February to April)
Root zone: Typically to a depth of 40 inches

Nearly all areas of this soil are in woodland.

This soil is not suited to cultivated crops or pasture. Slope and the stones on the surface are the main limitations. The elevation of the soil limits the length of the growing season.

The potential productivity for northern red oak on this soil is moderate. Slope limits the use of equipment, and rooting is restricted. Placing access roads and log skidding trails on the contour or across slopes helps reduce erosion.

Slope is the main limitation of the soil as a site for dwellings with basements and for local roads and streets.

Slow percolation and slope are the main limitations of the soil as a site for septic tank absorption fields.

Slope restricts this soil for most types of recreation use. Some scenic areas are used for hiking or unimproved picnic sites.

The capability subclass is VIIs.

LmC—Lanesboro-Monarda association, strongly sloping, very stony. This unit consists of very deep soils on the sides and tops of hills and mountains at an elevation of 1,000 feet or more. The Lanesboro soils are typically on the upper part of the slopes or in convex areas. The Monarda soils are typically on the lower parts of gentle slopes or in slightly concave areas. Stones and boulders on the surface are about 5 to 20 feet apart. Slopes range from 3 to 15 percent. The areas are irregularly shaped and range from 15 to 100 acres. This unit consists of about 60 percent well drained Lanesboro soils, 30 percent poorly drained Monarda soils, and 10 percent other soils.

The typical sequence, depth, and composition of the layers of this Lanesboro soil are as follows—

Surface layer:
surface to 4 inches, dark brown channery silt loam

Subsoil:
4 to 17 inches, dark yellowish brown channery silt loam with yellowish brown mottles in the lower part
17 to 41 inches, dark grayish brown channery silt loam with olive and yellowish brown streaks

Substratum:
41 to 47 inches, dark grayish brown and light brownish gray channery loam
47 to 60 inches, grayish brown channery loam with dark reddish brown stains

The typical sequence, depth, and composition of the layers of this Monarda soil are as follows—

Surface layer:
surface to 7 inches, brown channery silt loam

Subsoil:
7 to 14 inches, light yellowish brown channery silt loam with yellowish brown mottles
14 to 20 inches, light brownish gray channery silt loam with many yellowish brown mottles

Substratum:
20 to 60 inches, grayish brown channery silt loam with gray and yellowish brown streaks

Included with this unit in mapping are moderately

well drained and somewhat poorly drained soils that are similar to Lanesboro and Monarda soils. Also included are a few small areas of shallow Taconic and moderately deep Macomber soils.

Properties of the Lanesboro soils—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid throughout
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: 1.5 to 2.5 feet (February to April)
Root zone: Typically to a depth of 40 inches

Properties of the Monarda soils—

Permeability: Moderate in the surface layer and subsoil and slow or very slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to extremely acid in the surface layer and subsoil and very strongly acid or strongly acid in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: Surface to 1.5 feet (October to June)
Root zone: Typically to a depth of 20 inches

The soils in this unit are not suited to cultivated crops, hay, or pasture. The main limitations are the stones on the surface, the seasonal wetness, and a short growing season.

The potential productivity for northern red oak in this unit is moderate. Seasonal wetness in the Monarda soil makes the soil soft, which limits the operation of heavy timber harvesting equipment. It also results in a severe windthrow hazard.

Wetness, especially in the Monarda soils, and slope limit the soils as sites for dwellings with basements. The Lanesboro soils are better suited to dwellings. The slope in areas of the Lanesboro soils can be overcome by designing dwellings to conform to the natural lay of the land. Wetness can be reduced by installing subsurface drains around footings and foundations. In some areas of the Monarda soils, land shaping around the dwelling or interceptor drains are needed to divert runoff from higher areas. Maintaining the plant cover and establishing a plant cover soon after construction will reduce erosion.

Wetness, frost action, and slope are limitations of the soils as sites for local roads and streets. Wetness and frost action are more limiting in areas of the Monarda soils. A raised fill of coarse-grained material to frost depth will reduce wetness and frost action. Slope in areas of the Lanesboro soils can be overcome by land shaping and grading.

This unit is generally unsuitable as a site for septic tank absorption fields because of the seasonal high water table in the Monarda soils and the permeability in both soils.

These soils have few limitations for hiking paths and trails. Slope, surface stones, and seasonal wetness in areas of the Monarda soils and slope and stoniness in areas of the Lanesboro soils are the main limitations for recreation facilities such as campgrounds and picnic areas.

The capability subclass is VIIs.

Ln—Limerick silt loam. This soil is very deep, nearly level, and poorly drained. It is on flood plains. The areas are long and narrow, are adjacent to streams, and range from 5 to 100 acres. Slopes are generally smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark grayish brown silt loam

Subsoil:
6 to 21 inches, dark gray silt loam with strong brown and red mottles

Substratum:
21 to 60 inches, mottled light brownish gray silt loam with few thin strata of sand or sand and gravel

Included with this soil in mapping are a few slightly higher areas of somewhat poorly drained Linlithgo soils. Also included are areas of Fluvaquents and Udifluvents, frequently flooded, in areas where the drainage is variable. Inclusions make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer and moderately acid to neutral in the subsoil and substratum

Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: Surface to 1.5 feet (November to June)
Root zone: Unrestricted
Flood hazard: Frequent (November to May)

Most areas of this soil are wooded. The other areas are used for pasture or crops.

This soil is moderately suited to crops. Prolonged wetness and frequent flooding are the main limitations. Drainage and flood control are difficult to establish. Many fields are small and difficult to till. Planting trees along the streambank helps reduce erosion. Winter cover crops help protect the surface from the scouring action of floodwaters.

This soil is moderately suited to hay and pasture. Grazing during periods of wetness and flooding damages the soil.

The potential productivity for red maple on this soil is moderate. The prolonged wetness and frequent flooding restrict the use of heavy equipment and cause high seedling mortality by restricting the depth of rooting. Windthrow is a severe hazard.

Flooding and wetness are the main limitations of the soil as a site for dwellings with basements, for local roads and streets, and for septic tank absorption fields. Frost action is an additional limitation for local roads and streets. A coarse-grained fill above flood levels and to frost depth will help overcome the limitations for local roads and streets.

Some areas of this unit have potential as habitat for wetland wildlife.

The capability subclass is IIIw.

Lo—Linlithgo silt loam. This soil is very deep, nearly level, and somewhat poorly drained. It is on flood plains. The areas are irregular in shape or long and narrow and are generally parallel to the adjacent stream. Most areas range from 5 to 100 acres. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 13 inches, dark brown silt loam

Subsurface layer:
13 to 21 inches, very dark gray loam with dark brown mottles

Subsoil:
21 to 29 inches, grayish brown silt loam with yellowish brown mottles
29 to 37 inches, gray gravelly loam with strong brown and yellowish red mottles

Substratum:
37 to 60 inches, grayish brown very gravelly loamy sand

Included with this soil in mapping are small areas of well drained Occum soils on slightly higher convex parts of the flood plains. Also included are small depressions or swales of poorly drained Limerick soils. A few small areas of gravel are shown on the map by a special symbol. Inclusions make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and moderately rapid to rapid in the substratum
Available water capacity: High
Soil reaction: Strongly acid to slightly acid in the surface layer and subsoil and moderately acid to slightly acid in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 6 inches to 1.5 feet (January to May)
Root zone: Typically to a depth of at least 20 inches
Flood hazard: Occasional and brief from November to May

Most areas of this soil are used for cultivated crops. The other areas are in woodland or pasture. Where drained, this soil is classified as prime farmland. Although it is susceptible to flooding, the flooding normally does not occur during the growing season.

This soil is moderately suited to field and vegetable crops that do not require planting in early spring. The seasonal high water table and occasional spring flooding briefly delay tillage. Drainage for the wetter areas is difficult to achieve if a suitable outlet is not found. Cover crops and sod crops in the cropping system help to maintain tilth and protect the soil during periods of flooding. Planting trees along the streambank will help reduce streambank erosion.

This soil is moderately well suited to hay and pasture. Overgrazing reduces the quantity and quality of the forage. The surface is subject to damage by livestock during periods of seasonal wetness and flooding.

The potential productivity for sugar maple on this soil is moderate.

Flooding and wetness are the main limitations of the soil as a site for dwellings with basements, for local roads and streets, and for septic tank absorption fields. Frost action is an additional limitation for roads and streets, and poor filtering for septic tank absorption fields. A coarse-grained fill above flood levels and to frost depth will help overcome the flooding and frost action for roads and streets.

Some areas of this unit have potential as habitat for wetland wildlife.

The capability subclass is IIIw.

Lt—Livingston and Madalin soils. This unit consists of very deep, nearly level, very poorly drained soils in narrow drainageways mainly at the bottom of eroded gullies and in low spots on broad flats adjacent to the Hudson River. The areas in drainageways are long and narrow. The low spots are nearly round. The areas of the unit range from 5 to 50 acres. Some areas consist mostly of Livingston soils, some mostly of Madalin soils, and some of both. The Livingston soils and Madalin soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 45 percent Livingston soils, 40 percent Madalin soils, and 15 percent other soils. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of the Livingston soils are as follows—

Surface layer:
surface to 9 inches, very dark gray silty clay loam

Subsoil:
9 to 15 inches, gray clay with light olive brown mottles
15 to 22 inches, dark gray clay with red mottles
22 to 37 inches, dark grayish brown clay with red and gray mottles

Substratum:
37 to 60 inches, dark gray layers of clay and a few thin strata of dark brown silt

The typical sequence, depth, and composition of the layers of the Madalin soils are as follows—

Surface layer:
surface to 8 inches, very dark gray silt loam

Subsoil:
8 to 18 inches, very dark gray silt loam with strong brown mottles
18 to 29 inches, grayish brown silty clay loam with yellowish brown and dark yellowish brown mottles
29 to 42 inches, gray silty clay with olive brown mottles

Substratum:
42 to 60 inches, gray silty clay with olive brown mottles

Included with this unit in mapping are a few small areas of somewhat poorly drained Kingsbury and Rhinebeck and poorly drained to very poorly drained Canandaigua and Birdsall soils. The Kingsbury and Rhinebeck soils are at the edges of drainageways and in slightly convex areas. They make up about 5 percent of the unit. The Canandaigua and Birdsall soils are between clayey lowlands and more silty or sandy terraces and outwash plains. They make up about 10 percent of the unit. In some areas the surface layer of the Madalin soils is mucky silt loam.

Properties of the Livingston soils—

Permeability: Moderately slow in the surface layer and very slow or slow in the subsoil and substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, strongly acid to mildly alkaline in the subsoil, and mildly alkaline to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: Surface to 1 foot (September to July)
Root zone: Typically to a depth of about 22 inches

Properties of the Madalin soils—

Permeability: Moderately slow in the surface layer, slow in the subsoil, and slow or very slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to mildly alkaline in the surface layer, moderately acid to mildly alkaline in the subsoil, and mildly alkaline or moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: Surface to 6 inches (November to June)
Root zone: Typically to a depth of at least 20 inches

Most areas of this unit are wooded or in water-tolerant brush and alders. A few areas are used for pasture.

This unit is poorly suited to cultivated crops and pasture. Prolonged wetness and ponding are the main limitations. Most areas cannot be drained because adequate outlets are difficult to establish. Grazing when the soil is wet will destroy soil structure and damage vegetation.

The potential productivity for red maple on this unit is moderate. Prolonged wetness, ponding, and the clayey texture restrict the use of harvest equipment and cause high seedling mortality. Rooting is restricted by the prolonged high water table, and trees are easily uprooted during windy periods.

Wetness and a shrink-swell potential are the main limitations of the soils as sites for dwellings with basements. Surface drains around the foundation and interceptor drains upslope that divert runoff from higher areas will help to remove surface water. Drains placed around footings and backfilled with sand and gravel will lower the water table. Protective sealants on the foundation will help to reduce the risk of wet basements. Reinforcing footings and foundations and backfilling with sand and gravel will reduce structural damage caused by shrinking and swelling.

Low strength, frost action, and wetness are limitations of the soils as sites for local roads and streets. A coarse-grained raised fill to frost depth will reduce frost action and wetness and improve soil strength.

Wetness and slow percolation limit the soils as sites for septic tank absorption fields.

The capability subclass is IVw.

MaC—Macomber-Taconic association, strongly sloping, rocky. This unit consists of soils on the tops and sides of hills and mountains at an elevation of 1,000 feet or more. The Macomber soils are commonly on the side slopes and in small troughs between hills. The Taconic soils are typically on the hilltops and convex parts of side slopes, mainly adjacent to outcrops and ledges. The areas of this unit are irregularly shaped and range from 30 to 150 acres. This unit consists of about 40 percent well drained, moderately deep Macomber soils; 30 percent shallow, somewhat excessively drained Taconic soils; 29 percent mostly deep soils; and 1 percent exposed bedrock. Slopes range from 3 to 15 percent.

The surface of the Macomber soil is covered by 2 inches of partially decomposed leaf litter and organic matter. The typical sequence, depth, and composition of the layers of the Macomber soils are as follows—

Surface layer:
surface to 6 inches, dark yellowish brown channery silt loam

Subsoil:
6 to 22 inches, light olive brown very channery loam

Bedrock:
22 inches, hard folded shale

The typical sequence, depth, and composition of the layers of the Taconic soils are as follows—

Surface layer:
0 to 6 inches, brown channery silt loam

Subsoil:
6 to 14 inches, yellowish brown very channery silt loam

Bedrock:
14 inches, hard folded shale bedrock

Included with this unit in mapping are areas of deep, well drained Lanesboro soils on convex shoulder slopes of hills and mountains. Also included are areas of poorly drained and very poorly drained, nearly level soils in pockets and drainageways between knolls and hilltops.

Properties of the Macomber soils—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 20 to 40 inches

Properties of the Taconic soils—

Permeability: Moderate or moderately rapid
Available water capacity: Very low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 10 to 20 inches

Most areas of this unit are wooded or used for pasture.

These soils are poorly suited to cultivated crops because of rock outcrops and droughtiness. They are moderately suited to pasture.

The potential productivity of this unit for northern red oak is moderately high on the Macomber soils and moderate on the Taconic soils. Because of the depth to bedrock in Taconic soils, seedling mortality is severe and the windthrow hazard is moderate. Some uprooting of trees occurs during strong windstorms.

The depth to bedrock, the bedrock outcrops, and slope are the main limitations of the unit as a site for dwellings and for local roads and streets. Adapting the road design to the lay of the land and land shaping will overcome the slope.

The depth to bedrock is the main limitation of the unit as a site for septic tank absorption fields. Although the bedrock is deeper in Macomber soils than in Taconic soils, it still is not deep enough for septic tank absorption fields.

These soils have few limitations for trails and paths. Slope and the rock outcrops limit parts of this unit for camp and picnic areas.

The capability subclass is IVe.

MbE—Macomber-Taconic association, steep, very rocky. This unit consists of soils on the sides of hills and mountains at an elevation of 1,000 feet or more. The Macomber soils are commonly at the lower, more convex parts of sides slopes. The Taconic soils are on the steeper, higher parts of hillsides and mountainsides and commonly are adjacent to ledges and rock outcrops. The areas of the unit range from 30 to 250 acres. They are irregularly shaped. This unit consists of about 40 percent well drained, moderately deep Macomber soils; 30 percent shallow, somewhat excessively drained Taconic soils; 25 percent other soils; and 5 percent exposed bedrock. Slopes range from 15 to 35 percent.

The surface of the Macomber soil is covered by 2 inches of partially decomposed leaf litter and organic matter. The typical sequence, depth, and composition of the layers of the Macomber soils are as follows—

Surface layer:
surface to 6 inches, dark yellowish brown channery silt loam

Subsoil:
6 to 22 inches, light olive brown very channery loam

Bedrock:
22 inches, hard folded shale

The typical sequence, depth, and composition of the layers of the Taconic soils are as follows—

Surface layer:
0 to 6 inches, brown channery silt loam

Subsoil:
6 to 14 inches, yellowish brown very channery silt loam

Bedrock:
14 inches, hard folded shale bedrock

Included with this unit in mapping are areas of deep, well drained Lanesboro soils on lower convex shoulder slopes of hills and mountains. Also included are areas of poorly drained and very poorly drained, nearly level Aurelie soils in pockets and drainageways along and between hillsides.

Properties of the Macomber soils—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Very severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 20 to 40 inches

Properties of the Taconic soils—

Permeability: Moderate or moderately rapid
Available water capacity: Very low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Very severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 10 to 20 inches

Most areas of this unit are wooded. The soils are not suited to cultivated crops or hay and pasture because of slope, the rock outcrops, droughtiness, and erosion.

The potential productivity of this unit for northern red oak is moderately high on the Macomber soils and moderate on the Taconic soils. Because of the depth to bedrock in the Taconic soils, seedling mortality is severe and windthrow is a hazard. Slope limits the use of equipment.

The depth to bedrock, the bedrock outcrops, and slope are the main limitations of the unit as a site for dwellings and for local roads and streets.

The depth to bedrock and the slope are the main limitations for septic tank absorption fields. Although the bedrock is deeper in Macomber soils than in Taconic soils, it still is not deep enough for septic tank absorption fields.

Slope and the rock outcrops limit the unit for hiking paths and trails. The unit generally is too steep for campgrounds and picnic areas.

The capability subclass is VIIe.

MnA—Manlius channery silt loam, 0 to 3 percent slopes. This soil is moderately deep, nearly level, and well drained to excessively drained. It is on the tops of hills and ridges. The areas are oval or long and narrow and are oriented north-south. They range from 5 to 25 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark brown channery silt loam

Subsoil:
6 to 16 inches, light yellowish brown channery silt loam
16 to 27 inches, light yellowish brown very channery silt loam

Substratum:
27 to 34 inches, yellowish brown extremely channery silt loam

Bedrock:
34 inches, folded shale

Included with this soil in mapping are small areas of shallow Nassau soils at higher elevations that make up about 10 percent of the unit. Also included are small areas of Stockbridge and Bernardston soils in areas where the bedrock is at a depth of more than 40 inches. The Stockbridge and Bernardston soils make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate throughout
Available water capacity: Moderate
Soil reaction: Extremely acid to strongly acid in the surface layer and subsoil, very strongly acid to slightly acid in the substratum
Surface runoff: Medium
Erosion hazard: Very slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 20 to 40 inches

This soil is well suited to cultivated crops. Restricted rooting and droughtiness during dry seasons are the main limitations. Cover crops, conservation tillage, crop rotations, and crop residue and manure will maintain or increase organic matter content and improve the water-holding capacity. Irrigation during dry periods will improve yields. Lime and fertilizer requirements are generally high.

This soil is well suited to hay and pasture. The bedrock restricts the rooting of some legumes and grasses. Overgrazing reduces the quality and the quantity of the forage. Deferred and rotation grazing, lime and fertilizer, and weed and brush control improve hay and pasture yields.

The potential productivity of this soil for northern red oak is moderately high. The bedrock restricts root penetration, and some trees are uprooted during strong windstorms.

The depth to bedrock is the main limitation of the soil as a site for dwellings with basements. Building above the bedrock and landscaping with fill will help to overcome the depth to bedrock. Maintaining the plant cover and using temporary erosion-control structures during construction and establishing a plant cover soon after construction will reduce erosion.

The depth to bedrock and frost action limit the soil as a site for local roads and streets. Planning to avoid the rock will help overcome the limitation caused by bedrock. A coarse-grained subgrade or base material to frost depth will reduce frost action.

The depth to bedrock is the main limitation of the soil as a site for septic tank absorption fields.

The capability subclass is IIs.

MnB—Manlius channery silt loam, 3 to 8 percent slopes. This soil is moderately deep, gently sloping, and well drained to excessively drained. It is on the tops of hills and ridges. The areas are oval or long and narrow and are generally oriented north-south. They range from 5 to 25 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark brown channery silt loam

Subsoil:
6 to 16 inches, light yellowish brown channery silt loam

16 to 27 inches, light yellowish brown very channery silt loam

Substratum:
27 to 34 inches, yellowish brown extremely channery silt loam

Bedrock:
34 inches, folded shale

Included with this soil in mapping are small areas of shallow Nassau soils at higher elevations that make up about 10 percent of the unit. Also included are small areas of Stockbridge and Bernardston soils in areas where the bedrock is at a depth of more than 40 inches. The Stockbridge and Bernardston soils make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate throughout
Available water capacity: Moderate
Soil reaction: Extremely acid to strongly acid in the surface layer and subsoil, very strongly acid to slightly acid in the substratum
Surface runoff: Medium
Erosion hazard: Slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 20 to 40 inches

This soil is well suited to cultivated crops. Restricted rooting depth and droughtiness during dry seasons are the main limitations. Cover crops, conservation tillage, crop rotations, and crop residue and manure will maintain or increase organic matter content and improve the water-holding capacity. Irrigation during dry periods will improve yields. Lime and fertilizer requirements are generally high.

This soil is well suited to hay and pasture. The bedrock restricts the rooting of some legumes and grasses. Overgrazing reduces the quality and the quantity of the forage. Deferred and rotation grazing, lime and fertilizer, and weed and brush control improve hay and pasture yields.

The potential productivity of this soil for northern red oak is moderately high. The bedrock restricts root penetration, and some trees are uprooted during strong windstorms.

The depth to bedrock is the main limitation of the soil as a site for dwellings with basements. Building above the bedrock and landscaping with fill will help to overcome the depth to bedrock. Maintaining the plant cover and using temporary erosion-control structures during construction and establishing a plant cover soon after construction will reduce erosion.

The depth to bedrock and frost action limit the soil as a site for local roads and streets. Planning to avoid the rock will help overcome the limitation caused by bedrock. A coarse-grained subgrade or base material to frost depth will reduce frost action.

The depth to bedrock is the main limitation of the soil as a site for septic tank absorption fields.

This unit is well suited to recreation facilities such as picnic areas, campgrounds, and playgrounds.

The capability subclass is IIe.

MnC—Manlius channery silt loam, 8 to 15 percent slopes. This soil is moderately deep, strongly sloping, and well drained to excessively drained. It is on the sides of hills and ridges. The areas are irregular in shape or broad and are oriented north-south. They range from 5 to 25 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark brown channery silt loam

Subsoil:
6 to 16 inches, light yellowish brown channery silt loam
16 to 27 inches, light yellowish brown very channery silt loam

Substratum:
27 to 34 inches, yellowish brown extremely channery silt loam

Bedrock:
34 inches, folded shale

Included with this soil in mapping are small areas of shallow Nassau soils at higher elevations that make up about 10 percent of the unit. Also included are small areas of Stockbridge and Bernardston soils in areas where the bedrock is at a depth of more than 40 inches. The Stockbridge and Bernardston soils make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate throughout
Available water capacity: Moderate
Soil reaction: Extremely acid to strongly acid in the surface layer and subsoil, very strongly acid to

slightly acid in the substratum
Surface runoff: Rapid
Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 20 to 40 inches

This soil is moderately suited to cultivated crops. Erosion and droughtiness are the main limitations. Conservation tillage, stripcropping, cover crops, and crop rotations will reduce erosion and improve the moisture-holding capacity of the soil.

This soil is moderately well suited to pasture. The areas used for hay or pasture require lime and fertilizer. Grazing when the soil is wet will compact the surface layer and damage forage grasses. Rotation grazing and lime and fertilizer will help maintain the plant cover and reduce soil erosion.

The potential productivity for northern red oak on this soil is moderately high. The bedrock restricts root penetration, and some trees are uprooted during strong windstorms. The use of equipment increases the hazard of erosion. Placing access roads and trails on the contour or across slopes helps to prevent gully erosion.

The depth to bedrock is the main limitation of the soil as a site for dwellings with basements. Building above the bedrock and landscaping with fill will help to overcome the depth to bedrock. Maintaining the plant cover and using temporary erosion-control structures during construction and establishing a plant cover soon after construction will reduce erosion.

The depth to bedrock, slope, and frost action are the main limitations of the soil as a site for local roads and streets. Planning to avoid the rock will help overcome the limitation caused by bedrock. A coarse-grained subgrade or base material to frost depth will reduce frost action. Some land shaping and grading are necessary because of slope.

The depth to bedrock is the main limitation of the soil as a site for septic tank absorption fields.

Slope is the main limitation for recreation facilities such as picnic areas, campgrounds, and playgrounds. Grading and reshaping make some areas more suitable for these uses. Reseeding the graded areas reduces erosion.

The capability subclass is IIIe.

MnD—Manlius channery silt loam, 15 to 25 percent slopes. This soil is moderately deep, moderately steep, and well drained to excessively drained. It is on the sides of hills and ridges. The areas are generally long and narrow and are oriented north-south. They range from 5 to 25 acres. Slopes are generally smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark brown channery silt loam

Subsoil:
6 to 16 inches, light yellowish brown channery silt loam
16 to 27 inches, light yellowish brown very channery silt loam

Substratum:
27 to 34 inches, yellowish brown extremely channery silt loam

Bedrock:
34 inches, folded shale

Included with this soil in mapping are small areas of shallow Nassau soils at higher elevations that make up about 10 percent of the unit. Also included are small areas of Stockbridge and Bernardston soils in areas where the bedrock is at a depth of more than 40 inches. The Stockbridge and Bernardston soils make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate throughout
Available water capacity: Moderate
Soil reaction: Extremely acid to strongly acid in the surface layer and subsoil, very strongly acid to slightly acid in the substratum
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 20 to 40 inches

Most areas of this soil are woodland. A few areas are used for pasture.

This soil is poorly suited to cultivated crops. Erosion and slope are the main limitations. A crop rotation that includes several years of grasses and legumes and conservation tillage or terraces will reduce erosion. Slope limits the operation of tillage and harvesting equipment for hay or crops.

This soil is moderately suited to pasture. The areas used for pasture need lime and fertilizer. Rotation grazing will help maintain the plant cover and reduce soil erosion. Deferred grazing when the soil is wet will reduce compaction in the surface layer and help to

prevent damage to pasture grasses.

The potential productivity for northern red oak on this soil is moderately high. The bedrock restricts root penetration, and some trees are uprooted during strong windstorms. Slope limits the use of equipment, and its use increases the hazard of erosion. Placing access roads and trails on the contour or across slopes helps to prevent gully erosion.

The main limitations of the soil as a site for dwellings with basements and for septic tank absorption fields are the depth to bedrock and the slope.

Slope is the main limitation of the soil as a site for local roads and streets. Adapting the road design to the lay of the land or land shaping and grading will help overcome the slope.

Slope is the main limitation for recreation facilities such as picnic areas, campgrounds, and playgrounds. Grading and reshaping make some areas more suitable for these uses. Reseeding graded areas reduces erosion.

The capability subclass is IVe.

MsA—Massena silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and somewhat poorly drained to poorly drained. It is mainly in oval or rectangular areas mostly at the base of long, gradual slopes. A few areas are long and narrow. The somewhat poorly drained areas are mainly along the edges of the unit, and the poorly drained areas are in the center. The areas range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 7 inches, very dark grayish brown silt loam

Subsoil:
7 to 23 inches, dark grayish brown loam with yellowish brown, olive, and red mottles

Substratum:
23 to 80 inches, dark grayish brown loam with dark yellowish brown and yellowish brown mottles

Included with this soil in mapping are a few small areas of moderately well drained Georgia soils and very poorly drained Sun soils. Georgia soils are on slightly convex areas mainly at the edge of the unit. Sun soils are in slightly concave areas mainly near the center of the unit. Included areas make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and moderately slow or slow in the subsoil and substratum
Soil reaction: Moderately acid to neutral in the surface layer and subsoil, neutral to moderately alkaline in the substratum
Erosion hazard: Very slight
Depth to the seasonal high water table: 6 to 18 inches (November to May)
Root zone: Unrestricted

Most areas of this soil are used for hay and pasture. A few areas are in cropland. The rest are wooded. Where drained, this soil is classified as prime farmland.

This soil is moderately suited to crops. The seasonal high water table is the main limitation for most crops. It delays spring tillage and interferes with harvesting in some years. Subsurface drains work well in this soil if an adequate outlet is established. Cover crops, conservation tillage, and crop residue will help to maintain tilth.

This soil is moderately well suited to hay and pasture, especially to mixed hay and legumes if subsurface drains are installed. Grazing when the soil is too wet compacts the surface layer, destroying soil structure and damaging forage plants, and reduces the quality and quantity of forage. Deferred and rotation grazing and lime and fertilizer will help to maintain or increase the productivity of pasture.

The potential productivity for eastern white pine on this soil is very high. The seasonal high water table is the main limitation. It restricts tree roots, interferes with the operation of harvest equipment during wet periods, and causes seedling mortality. Timber harvesting on this soil is most easily accomplished during the dry season. Some shallow-rooted trees are easily blown over during windstorms.

Seasonal wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited as a site for dwellings without basements. Grading the land so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and adequately sealing the foundation will reduce wetness.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. A drainage system around the filter field and diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIw.

MsB—Massena silt loam, 3 to 8 percent slopes. This soil is very deep, nearly level, and somewhat poorly drained to poorly drained. It is mainly in oval or rectangular areas mostly at the base of long, gradual slopes. A few areas are long and narrow. The somewhat poorly drained areas are mainly along the edges of the unit, and the poorly drained areas are in the center. The areas range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 7 inches, very dark grayish brown silt loam

Subsoil:
7 to 23 inches, dark grayish brown loam with yellowish brown, olive, and red mottles

Substratum:
23 to 80 inches, dark grayish brown loam with dark yellowish brown and yellowish brown mottles

Included with this soil in mapping are a few small areas of moderately well drained Georgia soils and very poorly drained Sun soils. Georgia soils are on slightly convex areas mainly at the edge of the unit. Sun soils are in slightly concave areas mainly near the center of the unit. Included areas make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and moderately slow or slow in the subsoil and substratum
Soil reaction: Moderately acid to neutral in the surface layer and subsoil, neutral to moderately alkaline in the substratum
Erosion hazard: Slight
Depth to the seasonal high water table: 6 to 18 inches (November to May)
Root zone: Unrestricted

Most areas of this soil are used for hay or pasture. A few areas are in cropland. The rest are wooded. Where drained, this soil is classified as prime farmland.

This soil is moderately suited to cropland. The seasonal high water table is the main limitation for most crops. It delays spring tillage and interferes with harvesting in some years. Subsurface drains work well in this soil. Erosion is a hazard on cropland, especially at the upper limits of the slope range. Cover crops, conservation tillage, and crop rotations will help to maintain the productivity of this soil and reduce erosion.

This soil is moderately well suited to hay and pasture, especially to mixed hay and legumes if subsurface drains are installed. Grazing when the soil is too wet compacts the surface layer, destroying soil structure and damaging forage plants, and reduces the quality and quantity of forage. Deferred and rotation grazing and lime and fertilizer will help to maintain or increase the productivity and reduce erosion.

The potential productivity for eastern white pine on this soil is very high. The seasonal high water table is the main limitation. It restricts tree roots, interferes with the operation of harvest equipment during wet periods, and causes seedling mortality. Timber harvesting on this soil is most easily accomplished during the dry season. Some shallow-rooted trees are easily blown over during windstorms.

Seasonal wetness is the main limitation of this soil as a site for dwellings with basements. Dwellings without basements are more suitable. Installing interceptor drains that divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. The erosion hazard is severe during construction. Maintaining the plant cover, using temporary erosion-control structures during construction, and establishing a plant cover on disturbed areas soon after construction will reduce erosion.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. A drainage system around the filter field and diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIw.

NaB—Nassau channery silt loam, undulating, rocky. This soil is shallow and somewhat excessively drained. It is on the tops of hills and ridges and in a few broader areas at high elevations. Most areas are long and narrow and oriented north-south. The areas range from 5 to 50 acres. Slopes are complex and irregular and range from 1 to 6 percent. Exposed bedrock covers from less than 1 percent to 2 percent of the surface.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 3 inches, dark brown channery silt loam

Subsoil:
3 to 17 inches, yellowish brown very channery silt loam

Bedrock:
17 inches, brown and gray, folded, hard shale

Included with this soil in mapping are small areas of moderately deep, well drained to excessively drained Manlius soils; well drained, very deep Bernardston soils; moderately well drained, very deep Pittstown soils; and very poorly drained, very deep Alden soils. Manlius, Bernardston, and Pittstown soils are in troughs and on the sides of low knolls. They make up about 15 percent of the unit. Alden soils are in long, narrow drainageways and small impounded pockets and make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 10 to 20 inches

Most areas of this soil are used for pasture or are wooded. A few areas are used for cultivated crops or apple orchards.

This soil is moderately suited to crops. The main limitation is the depth to bedrock. During most years, crops are moisture stressed during critical growth periods. Hay is better suited to this soil than row crops are, but still is subject to droughtiness. Maintaining permanent hay or sod on the soil will reduce the erosion hazard. Crop residue and organic material will increase the rate of infiltration and the availability of water. Apple trees are well suited to this soil, but the mortality rate is high for seedlings. Most areas used for apples are irrigated during dry periods.

This soil is moderately well suited to pasture. Overgrazing reduces the quality and quantity of forage, and erosion is a hazard if the cover is completely removed. Deferred and rotation grazing, lime and fertilizer, and weed and brush control help increase the quality and quantity of pasture forage.

The potential productivity of this soil for sugar maple is moderate. Seedling mortality is high because of droughtiness. Bedrock restricts root penetration, and trees are uprooted during windstorms.

The depth to bedrock is the main limitation of the soil as a site for dwellings with basements, for local roads and streets, and for septic tank absorption fields. The bedrock in this soil is hard shale and generally is not easily ripped. Building above the bedrock and landscaping with fill will help to overcome the bedrock.

The capability subclass is IIIe.

NbC—Nassau channery silt loam, rolling, very rocky. This soil is shallow and somewhat excessively drained. It is on the sides and tops of small hills and ridges. Most areas are long and narrow and oriented north-south. The areas range from 5 to 50 acres. Slopes are complex and irregular and range from 6 to 16 percent. Exposed bedrock covers 2 to 10 percent of the surface (fig. 5).

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 3 inches, dark brown channery silt loam

Subsoil:
3 to 17 inches, yellowish brown very channery silt loam

Bedrock:
17 inches, brown and gray, folded, hard shale

Included with this soil in mapping are small areas of moderately deep, well drained Manlius soils; well drained, very deep Bernardston soils; moderately well drained, very deep Pittstown soils; and very poorly drained, very deep Alden soils. Manlius, Bernardston, and Pittstown soils are in troughs and on the sides of low knolls. They make up about 15 percent of the unit. Alden soils are in long, narrow drainageways and small impounded pockets and make up 5 percent of the unit.

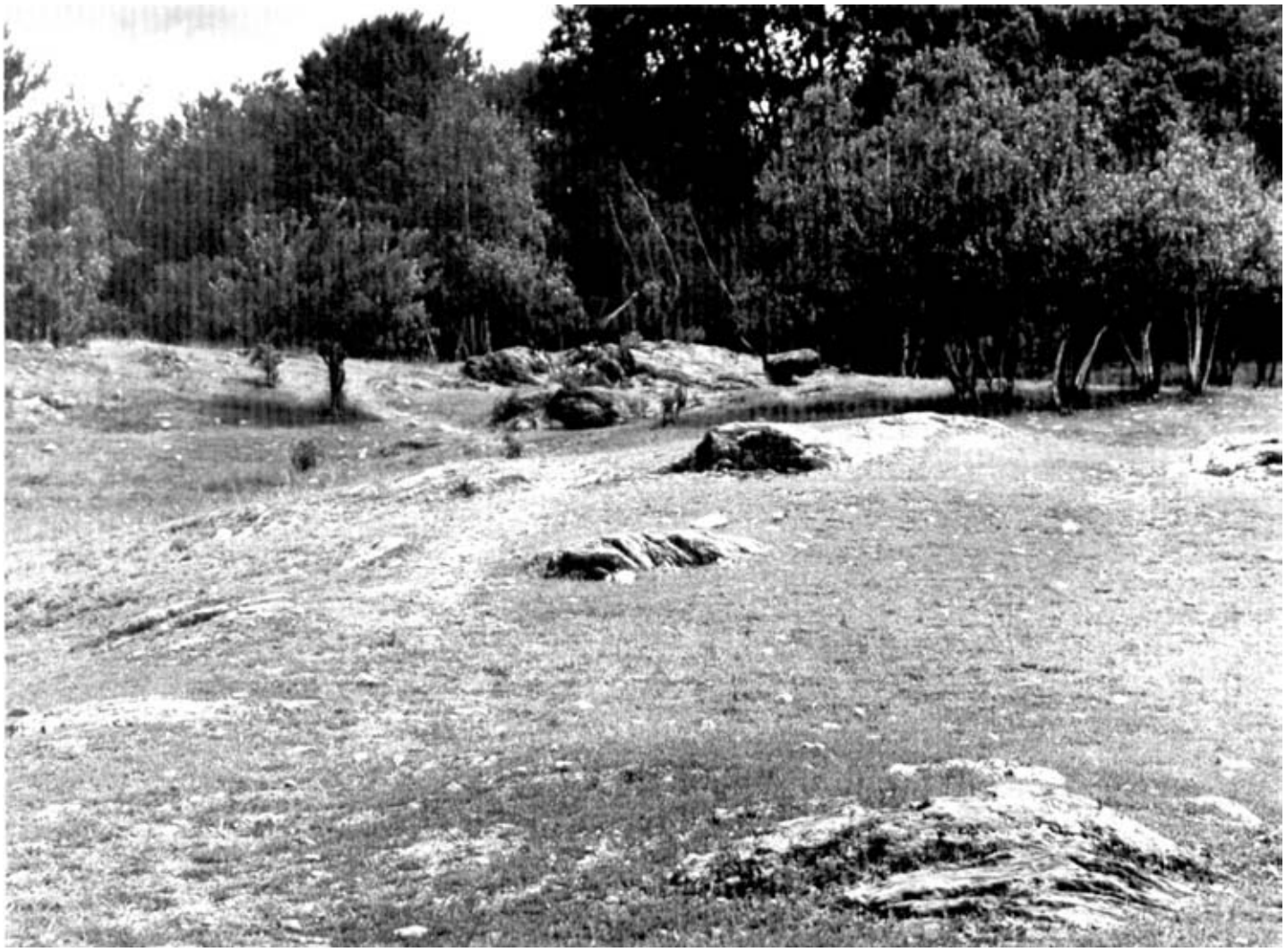

Figure 5.—Rock outcrops on Nassau channery silt loam, rolling, very rocky.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 10 to 20 inches

Most areas of this soil are used for pasture or are wooded. A few areas are used for cultivated crops or apple orchards.

This soil generally is not suited to crops. The main limitation is the depth to bedrock. During most years, crops are moisture stressed during critical growth periods. Erosion of the entire layer of this soil is a hazard in areas without a plant cover. The soil is better suited to hay than to row crops, but hay still is subject to droughtiness. Maintaining a permanent hay or sod cover will reduce the erosion hazard. Apple trees are well suited to this soil, but the mortality rate is high for seedlings. Most areas used for apples are irrigated during dry periods.

This soil is poorly suited to pasture. Overgrazing reduces the quality and quantity of forage and

increases erosion if the plant cover is completely removed. Deferred and rotation grazing, lime and fertilizer, and weed and brush control help increase the quality and quantity of pasture forage.

The potential productivity for sugar maple on this soil is moderate. Seedling mortality is high because of droughtiness. The bedrock restricts root penetration, and trees are uprooted during windstorms.

The depth to bedrock is the main limitation of the soil as a site for dwellings with basements, for local roads and streets, and for septic tank absorption fields. The bedrock in this soil is hard shale and generally is not easily ripped. Building above the bedrock and landscaping with fill will help to overcome the bedrock.

Maintaining the plant cover during construction and establishing a plant cover soon after construction will help to control erosion.

Slope, the rock outcrops, and the depth to bedrock are limitations for most recreation uses.

The capability subclass is VIs.

NbD—Nassau channery silt loam, hilly, very rocky. This soil is shallow and somewhat excessively drained. It is on the sides of hills and ridges. Most areas are long and narrow and oriented north-south. The areas range from 5 to 25 acres. Slopes are complex and irregular and range from 16 to 30 percent. Exposed bedrock covers 2 to 10 percent of the surface.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 3 inches, dark brown channery silt loam

Subsoil:
3 to 17 inches, yellowish brown very channery silt loam

Bedrock:
17 inches, brown and gray, folded, hard shale

Included with this soil in mapping are small areas of moderately deep, well drained Manlius soils; well drained, very deep Bernardston soils; moderately well drained, very deep Pittstown soils; and very poorly drained, very deep Alden soils. Manlius, Bernardston, and Pittstown soils are in troughs and on the sides of low knolls. They make up about 15 percent of the unit. Alden soils are in long, narrow drainageways and small impounded pockets and make up about 2 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 10 to 20 inches

Most areas of this soil are wooded. A few areas are used for pasture.

This soil generally is not suited to crops because of the bedrock and the slopes. Droughtiness is a hazard, and the safe operation of tillage and harvesting equipment is difficult. Maintaining permanent pasture, brush, or woodland will reduce erosion.

This soil is poorly suited to pasture. Overgrazing reduces the quality and quantity of forage and increases the hazard of erosion if the plant cover is completely removed. Deferred and rotation grazing, lime and fertilizer, and weed and brush control help increase the quality and quantity of pasture forage.

The potential productivity of this soil for sugar maple is moderate. Seedling mortality is high because of droughtiness. Bedrock restricts root penetration, and trees are uprooted during windstorms. Slopes make the safe operation of harvest equipment difficult in most areas.

The depth to bedrock, the bedrock outcrops, and the slope are the main limitations of this soil as a site for dwellings, for local roads and streets, and for septic tank absorption fields.

The capability subclass is VIs.

NbE—Nassau channery silt loam, steep, very rocky. This soil is shallow and somewhat excessively drained. It is on the sides of large hills and ridges. Most areas are long and narrow and run north-south or form narrow bands around steep hills. The areas range from 5 to 20 acres. Slopes are generally smooth and range from 25 to 35 percent. Exposed bedrock covers 2 to 10 percent of the surface.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 3 inches, dark brown channery silt loam

Subsoil:
3 to 17 inches, yellowish brown very channery silt loam

Bedrock:
17 inches, brown and gray, folded, hard shale

Included with this soil in mapping are small areas of moderately deep, well drained Manlius soils; moderately well drained, very deep Pittstown soils; and very poorly drained, very deep Alden soils. Manlius and Pittstown soils are at the base of steep hillsides and make up about 10 to 15 percent of the unit. Alden soils are in long, narrow drainageways and small impounded pockets and make up about 2 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Very severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 10 to 20 inches

This soil generally is not suited to farming. The slopes are too steep and the erosion rates too high.

The potential productivity for sugar maple on this soil is moderate. Seedling mortality is high because of droughtiness. Bedrock restricts root penetration, and some trees are blown over by heavy winds. Slope makes use of harvest equipment difficult.

The depth to bedrock, the bedrock outcrops, and the slope are the main limitations of this soil as a site for dwellings, for local roads and streets, and for septic tank absorption fields.

The capability subclass is VIIs.

NgA—Niagara silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and somewhat poorly drained. It is on dissected lowlands. The areas of this soil are broad, linear, or irregular in shape and range from 5 to 50 acres. Slopes are generally smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, very dark grayish brown silt loam

Subsoil:
8 to 12 inches, olive brown silt loam with yellowish brown mottles
12 to 18 inches, grayish brown silt loam with yellowish brown mottles
18 to 23 inches, grayish brown silty clay loam with yellowish brown mottles

Substratum:
23 to 60 inches, light brownish gray, varved silt and clay with yellowish brown mottles

Included with this soil in mapping are small areas of moderately well drained Collamer soils on higher positions on the landscape. They make up about 10 percent of the unit. Also included are small areas of Canandaigua soils in depressions and along drainageways. They also make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and moderately slow in the subsoil and substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to mildly alkaline in the subsoil, and neutral to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 6 to 18 inches (December to May)
Root zone: Typically extends to a depth of about 23 inches

Most areas of this soil are in crops or woodland. The other areas are pasture. Where drained, the soil is classified as prime farmland.

This soil is moderately suited to crops. Cultivated crops are better suited to drained areas than to undrained areas where seasonal wetness delays tillage in the spring. In some areas subsurface drains require wrapped joints or filters to prevent very fine sand and silt from plugging the drains. In some other areas a ridge planting system improves surface drainage. Cover crops and crop residue increase organic matter content and improve soil quality.

This soil is moderately well suited to hay and pasture. Grazing during periods of seasonal wetness damages the surface layer. Proper stocking rates, rotation grazing, and weed and brush control increase the quantity and quality of feed and forage.

This soil has a moderate potential productivity for sugar maple. Prolonged wetness restricts the use of equipment and causes moderate seedling mortality. Rooting is restricted by the seasonal high water table, and some trees are uprooted during windy periods.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIw.

NgB—Niagara silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and somewhat poorly drained. It is on dissected lowlands. The areas of this soil are irregular in shape or linear and range from 5 to 20 acres. Slopes are generally smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, very dark grayish brown silt loam

Subsoil:
8 to 12 inches, olive brown silt loam with yellowish brown mottles
12 to 18 inches, grayish brown silt loam with yellowish brown mottles
18 to 23 inches, grayish brown silty clay loam with yellowish brown mottles

Substratum:
23 to 60 inches, light brownish gray, varved silt and clay with yellowish brown mottles

Included with this soil in mapping are small areas of moderately well drained Collamer soils on higher positions on the landscape. They make up about 10 percent of the unit. Also included are small areas of Canandaigua soils in depressions and along drainageways. They also make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and moderately slow in the subsoil and substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to mildly alkaline in the subsoil, and neutral to moderately alkaline in the substratum
Surface runoff: Moderate
Erosion hazard: Moderate
Depth to the seasonal high water table: 6 to 18 inches (December to May)
Root zone: Typically to a depth of about 23 inches

Most areas of this soil are in cropland or woodland. The other areas are pasture.

This soil is moderately suited to cropland. Seasonal wetness and erosion are the main limitations. Cultivated crops are better suited to drained areas than to undrained areas where seasonal wetness delays tillage in spring. Some subsurface drains require wrapped joints or filters to prevent very fine sand and silt from plugging the drains. Cover crops and crop residue increase organic matter content and improve soil quality. A conservation tillage system that leaves crop residue on the surface and contour farming or stripcropping will control erosion.

This soil is moderately well suited to hay and pasture. Grazing during periods of seasonal wetness damages the surface layer. Proper stocking rates, rotation grazing, and weed and brush control increase the quantity and quality of feed and forage.

This soil has a moderate potential productivity for sugar maple. Prolonged wetness restricts the use of equipment and causes moderate seedling mortality. Rooting is restricted by the seasonal high water table, and some trees are uprooted during windy periods.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIw.

Om—Occum loam. This soil is very deep, nearly level, and well drained. It is on flood plains. The areas are long and narrow or irregularly shaped. They range from 5 to 100 acres. Slopes are generally smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, dark brown loam

Subsoil:
10 to 25 inches, brown fine sandy loam
25 to 33 inches, dark yellowish brown coarse sandy loam

Substratum:
33 to 60 inches, light brownish gray, dark brown, and brown layers of sand and gravel

Included with this soil in mapping are a few slightly lower areas of somewhat poorly drained Linlithgo soils and small pockets or swales of poorly drained and very poorly drained Limerick soils. Also included are a few small areas of gravel that are shown on the map with a spot symbol. Inclusions make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate or moderately rapid in the surface layer and upper part of the subsoil, moderate in the lower part of the subsoil, and rapid in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to slightly acid throughout
Surface runoff: Slow
Erosion hazard: Slight
Root zone: Typically to sand and gravel at a depth of about 33 inches
Flood hazard: Occasional and brief from February to April

Most areas of this soil are in cultivated crops. The other areas are in woodland or pasture. This soil is classified as prime farmland.

This soil is well suited to field and vegetable crops. Flooding is the main limitation, but it rarely occurs during the growing season. Planting trees along streambanks will help reduce streambank erosion, and winter cover crops help protect the soil surface from the scouring action of floodwater.

This soil is well suited to hay and pasture. Overgrazing reduces the quantity and quality of the forage. Deferred and rotation grazing, lime and fertilizer, harvest at the proper stage of plant growth, and weed and brush control help to increase the quantity and quality of feed and forage.

The potential productivity for eastern white pine on this soil is very high.

Flooding is the main limitation of this soil as a site for dwellings with basements and for local roads and streets. Using fill to raise the road above flood level will reduce flood damage.

Flooding and poor filtering are limitations of the soil as a site for septic tank absorption fields. The poor filtering causes a hazard of contamination to ground water.

The capability class is I.

OvA—Ovid silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and somewhat poorly drained. It is on tops of hills, at the base of long, gentle slopes, and along drainageways. The areas of this soil are oval or long and narrow and range from 5 to 25 acres. Slopes are generally smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, brown silt loam

Subsurface layer:
8 to 13 inches, brown silt loam with yellowish brown mottles

Subsoil:
13 to 19 inches, brown silty clay loam with olive yellow mottles
19 to 34 inches, reddish gray silty clay loam with yellowish brown mottles

Substratum:
34 to 80 inches, brown silty clay loam

Included with this soil in mapping are small areas of well drained to moderately well drained Cazenovia soils

and very poorly drained Alden and Sun soils. Cazenovia soils are on slightly higher spots and make up about 10 percent of the unit. Sun and Alden soils are in depressions and along drainageways and make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer, moderately slow in the subsoil, and slow in the substratum
Soil reaction: Moderately acid to slightly acid in the surface layer, moderately acid to neutral in the subsoil, and mildly alkaline to moderately alkaline in the substratum
Erosion hazard: Slight
Depth to the seasonal high water table: 6 inches to 2 feet (January to May)
Root zone: Typically to a depth of about 34 inches

Most areas of this soil are used for hay or pasture. A few areas are in cropland, and the rest are wooded. Where drained, this soil is classified as prime farmland.

This soil is moderately suited to crops. The seasonal high water table is the main limitation for most crops and will delay spring tillage and sometimes interferes with harvesting. Subsurface drains work well in this soil if an adequate outlet is established. Cover crops, conservation tillage, and crop rotations help to maintain the productivity of this soil.

This soil is moderately suited to hay and pasture, especially to mixed hay and legumes if subsurface drains are installed. Grazing when the soil is too wet will compact the surface layer, destroying soil structure and damaging forage plants. Overgrazing reduces the quality and quantity of forage. Deferred and rotation grazing and lime and fertilizer will help to maintain or increase the productivity of pasture.

The potential productivity for northern red oak on this soil is moderately high. The seasonal high water table causes restricted root penetration, interferes with the operation of harvesting equipment during wet periods, and causes seedling mortality. Timber harvesting is most easily accomplished during the dry season. Some shallow-rooted trees are easily blown over during windstorms.

The potential productivity of this soil for sugar maple is moderate. Operating large equipment is difficult while the soil is wet, and timber harvest can be done more easily when the soil is dry or frozen.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIw.

OvB—Ovid silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and somewhat poorly drained. It is on tops of hills, at the base of long, gentle slopes, and along drainageways. The areas of this soil are oval or long and narrow and range from 5 to 100 acres. Slopes are generally smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, brown silt loam

Subsurface layer:
8 to 13 inches, brown silt loam with yellowish brown mottles

Subsoil:
13 to 19 inches, brown silty clay loam with olive yellow mottles
19 to 34 inches, reddish gray silty clay loam with yellowish brown mottles

Substratum:
34 to 80 inches, brown silty clay loam

Included with this soil in mapping are small areas of well drained to moderately well drained Cazenovia soils and very poorly drained Alden and Sun soils. Cazenovia soils are on slightly higher spots and make up about 10 percent of the unit. Sun and Alden soils are in depressions and along drainageways and make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer, moderately slow in the subsoil, and slow in the substratum
Soil reaction: Moderately acid to slightly acid in the surface layer, moderately acid to neutral in the subsoil, and mildly alkaline to moderately alkaline in the substratum
Erosion hazard: Slight

Depth to seasonal high water table: 6 inches to 2 feet (January to May)
Root zone: Typically to a depth of about 34 inches

Most areas of this soil are used for hay or pasture. A few areas are in cropland, and the rest are wooded.

This soil is moderately suited to cropland. The seasonal high water table is the main limitation for most crops. It delays spring tillage and sometimes interferes with harvesting. Subsurface drains in a random pattern work well to reduce wetness. Erosion will occur on cropland, especially at the upper limits of the slope range. Cover crops, conservation tillage, and a crop rotation help to maintain the productivity of this soil and reduce erosion.

This soil is moderately well suited to hay or pasture, especially to mixed hay and legumes if subsurface drains are installed. Grazing when the soil is too wet will compact the surface layer, destroying soil structure and damaging forage plants. Overgrazing reduces the quality and quantity of forage. Deferred and rotation grazing and lime and fertilizer will help to maintain or increase the productivity and reduce erosion.

The potential productivity for northern red oak on this soil is moderately high. The seasonal high water table causes restricted root penetration, interferes with the operation of harvesting equipment during wet periods, and causes seedling mortality. Timber harvesting is most easily accomplished during the dry season. Some shallow-rooted trees are easily blown over during windstorms.

Wetness is the main limitation of the soil as a site for dwellings with basements. This soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIw.

Pa—Palms muck. This soil is very deep, level, and very poorly drained. It is in small depressions in areas of outwash, in swales and impounded areas on flood plains, and between slopes and in drainageways in bedrock-controlled areas. The areas on outwash plains are round or oval. The areas in drainageways and on flood plains are mainly long and narrow. The areas of this soil range from 5 to 36 acres. Slopes are generally less than 1 percent.

The typical sequence, depth, and composition of the tiers of this soil are as follows—

Surface tier:
surface to 12 inches, black muck

Subsurface tiers:
12 to 16 inches, black muck
16 to 20 inches, very dark grayish brown muck

Substratum:
20 to 34 inches, gray silt loam with 5 percent rock fragments
34 to 60 inches, greenish gray fine sandy loam with 10 percent rock fragments

Included with this soil in mapping are areas of very poorly drained Carlisle and Limerick soils. Carlisle soils are in the center of areas of this Palms soil and have a thicker organic layer. Limerick soils are on active flood plains near the perimeter of the unit where the organic matter is thinner. Inclusions make up about 15 percent of the unit.

Soil properties—

Permeability: Moderately slow to moderately rapid in the surface and subsurface tiers and moderately slow to moderate in the substratum
Available water capacity: High
Soil reaction: Strongly acid to mildly alkaline in the surface and subsurface tiers and slightly acid to moderately alkaline in the substratum
Surface runoff: Very slow or ponded
Erosion hazard: Slight
Seasonal high water table: 1 foot above the surface to 1 foot below (November to May)

Most areas of this soil are in woodland. A few areas are mined for muck used in the manufacture of soil conditioners.

This soil is generally unsuited to cultivated crops,

hay, or pasture. The high water table prohibits tillage, harvesting, or grazing.

The potential productivity for red maple on this soil is moderate. Wooded areas generally are not harvested because of the high water table and because the muck cannot support most types of timber harvesting equipment. A few areas are harvested for firewood when the surface is frozen. Seedling mortality and the windthrow hazard are high.

Subsidence, ponding, and low strength are the main limitations of this soil as a site for dwellings with basements. Subsidence, ponding, and frost action are the main limitations for local roads and streets. Subsidence and ponding are the main limitations for septic tank absorption fields. The potential is good on this soil for wetland wildlife habitat.

The capability subclass is Vw.

Pr—Pits, quarry. This unit consists of areas of bedrock excavated for construction materials such as crushed stone for road surfaces and aggregate for cement. The major areas of this unit are in the Becraft limestone formation just south of the city of Hudson. The quarries are irregularly shaped and cover a total of about 500 acres.

The sides of quarries generally are vertical, and the floors are irregular and strewn with rubble and rock fragments. Some quarries are filled with water.

Inactive quarries are difficult to reclaim because the slopes cannot be smoothed and graded and not enough soil is available for filling and reshaping excavated areas. A few bushes and small trees are in the cracks of the wall and floor.

This unit is not assigned to a capability subclass.

Ps—Pits, sand and gravel. This unit consists of areas that have been excavated for sand and gravel used for construction. The areas are irregular in shape and range from 5 to 30 acres. Many of the pits have short, steep slopes along the edges.

The rate of water movement through this unit is rapid or very rapid. In some areas the water table is at or near the surface most of the year. A few areas are adjacent to streams and are subject to periodic flooding.

Included with this unit in mapping are small areas of somewhat excessively drained Hoosic and Knickerbocker soils and well drained Blasdell soils. Also included are areas of spoil consisting of sandy or gravelly overburden, areas of exposed bedrock, and a few small ponds.

The active pits have no plant cover. The older abandoned pits have some drought-tolerant grass and shrubs. The pits that are no longer mined can be smoothed and reclaimed to prevent erosion.

Most abandoned or reclaimed areas of this unit provide habitat for wildlife. The potential for timber is low because of droughtiness. Windthrow and seedling mortality rates are high.

The gravel pits, even reclaimed, have variable suitability for community development and recreation. Determination of the suitability of reclaimed pits for any use requires onsite investigation.

This unit is not assigned to a capability subclass.

PtB—Pittstown silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. It is on low hills, hilltops, and drumlins. The areas are oval or irregularly shaped. They range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, brown silt loam

Subsoil:
8 to 15 inches, dark yellowish brown silt loam and 5 percent rock fragments
15 to 21 inches, light olive brown silt loam with yellowish brown mottles and 10 percent rock fragments

Substratum:
21 to 60 inches, dark grayish brown, very firm silt loam with yellowish brown mottles and 10 percent rock fragments

Included with this soil in mapping are a few small areas of well drained Bernardston soils, somewhat poorly drained Punsit soils, and very poorly drained Alden soils. Bernardston soils are on slightly higher convex areas and make up about 5 percent of the unit. Punsit soils are in slightly lower areas or at the margins of gentle slopes and make up about 10 percent of the unit. Alden soils are in drainageways and concave areas and make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid
Surface runoff: Medium
Erosion hazard: Slight

Depth to the seasonal high water table: 1.5 to 3 feet (November to April)
Root zone: Typically to a depth of about 21 inches

Most areas of this soil are in permanent hayland. A few areas are in cultivated crops or pasture, and the rest are wooded. This soil is classified as prime farmland.

This soil is well suited to cultivated crops. The seasonal high water table slightly delays spring tillage and prevents the soil from warming early. Subsurface drains, particularly those in wetter inclusions, and interceptor drains that divert surface and subsurface water from higher adjacent soils will improve field moisture conditions. Contour farming, cover crops, conservation tillage, crop rotations, and tillage at proper moisture content will reduce soil erosion, improve soil tilth, and maintain soil productivity.

This soil is well suited to hay and pasture. The substratum and the seasonal high water table restrict the root growth of some legumes. Grazing when the soil is too wet will compact the surface layer, and overgrazing reduces the quantity and quality of the forage. Deferred and rotation grazing, lime and fertilizer, harvest at the proper stage of plant growth, and weed and brush control help to increase the quantity and quality of feed and forage.

The potential productivity for northern red oak on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. The soil is soft when wet, restricting the use of heavy equipment.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Specially designed and installed systems are needed for onsite sewage disposal.

This soil is suitable for such recreation facilities as hiking trails, playgrounds, and picnic areas. Athletic fields need subsurface drainage.

The capability subclass is IIe.

PtC—Pittstown silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and moderately well drained. It is on hills, side slopes, and drumlins. The areas are oval, long and narrow, or irregularly shaped. They range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, brown silt loam

Subsoil:
8 to 15 inches, dark yellowish brown silt loam and 5 percent rock fragments
15 to 21 inches, light olive brown silt loam with yellowish brown mottles and 10 percent rock fragments

Substratum:
21 to 60 inches, dark grayish brown, very firm silt loam with yellowish brown mottles and 10 percent rock fragments

Included with this soil in mapping are a few small areas of well drained Bernardston soils, somewhat poorly drained Punsit soils, and very poorly drained Alden soils. Bernardston soils are on slightly higher convex areas and make up about 5 percent of the unit. Punsit soils are in slightly lower areas or at the margins of gentle slopes and make up about 10 percent of the unit. Alden soils are in drainageways and concave areas and make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: 1.5 to 3 feet (November to April)
Root zone: Typically to a depth of about 21 inches

Most areas of this soil are in permanent hayland or pasture. The other areas are wooded.

This soil is moderately suited to cultivated crops. The seasonal high water table, the slope, the erosion hazard, and the restricted rooting depth are the main limitations. Interceptor drains that divert water from higher adjacent slopes and subsurface drains, especially in inclusions of wetter soils, improve field moisture conditions for early tillage and seed germination. Erosion is especially severe on long

cultivated slopes. Crop rotations with sod crops, conservation tillage, contour farming, stripcropping, and cover crops reduce the erosion hazard, improve tilth, and increase the moisture-holding capacity.

This soil is moderately well suited to hay and pasture. The substratum and the seasonal high water table restrict the root growth of some legumes. Grazing when the soil is too wet will compact the surface layer, and overgrazing reduces the quantity and quality of the forage. Deferred and rotation grazing, lime and fertilizer, harvest at the proper stage of plant growth, and weed and brush control help to increase the quantity and quality of feed and forage.

The potential productivity for northern red oak on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. The soil is soft when wet, restricting the use of heavy equipment.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Specially designed and installed systems are needed for onsite sewage disposal.

This soil is suitable for such recreation facilities as hiking trails, playgrounds, and picnic areas. The permeability, seasonal high water table, and slope limit its use for athletic fields.

The capability subclass is IIIe.

PtD—Pittstown silt loam, 15 to 25 percent slopes. This soil is very deep, steep, and moderately well drained. It is on hillsides, on shoulder slopes, and on sides of drumlins. The areas are long and narrow and oriented north-south. Some of those on drumlins are curved. The areas of this soil range from 5 to 15 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, brown silt loam

Subsoil:
8 to 15 inches, dark yellowish brown silt loam and 5 percent rock fragments
15 to 21 inches, light olive brown silt loam with yellowish brown mottles and 10 percent rock fragments

Substratum:
21 to 60 inches, dark grayish brown, very firm silt loam with yellowish brown mottles and 10 percent rock fragments

Included with this soil in mapping are a few small areas of well drained Bernardston soils, somewhat poorly drained Punsit soils, and very poorly drained Alden soils. Bernardston soils are on ridges between drainageways on slope faces. They make up about 5 percent of the unit. Punsit soils are in eroded and dissected areas downslope and make up about 5 percent of the unit. Alden soils are in narrow drainageways and make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid
Surface runoff: Medium
Erosion hazard: Severe
Depth to the seasonal high water table: 1.5 to 3 feet (November to April)
Root zone: Typically to a depth of about 21 inches

Most areas of this soil are wooded. A few areas are in permanent hayland or pasture.

This soil is poorly suited to cultivated crops. Erosion and slope are the main limitations for cultivated crops. The erosion hazard is especially severe where cover crops or sod are removed. A rotation with several years of grasses and legumes, stripcropping, diversion ditches, cross-slope tillage, cover crops, and conservation tillage help to reduce erosion. Operation of tillage and harvesting equipment is unsafe on the slopes, especially at the upper limits of the slope range.

This soil is moderately suited to pasture. Proper stocking rates, rotation grazing, and restricted grazing during wet periods will protect the pasture. Erosion is a hazard if pastures are overgrazed.

The potential productivity for northern red oak is moderately high. Placing logging roads and skid trails on the contour or across slopes will prevent them from washing and forming gullies. Seeds and seedlings survive and grow well if competing vegetation is controlled. Slope limits the use of equipment, and the

soil is soft when wet, restricting the use of heavy equipment.

Seasonal wetness and slope are the main limitations of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Building on the contour of the slope will help overcome the slope. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will help reduce wetness. Maintaining the plant cover, using temporary erosion-control structures during construction, and establishing a plant cover soon after construction will help control erosion.

Slope is the main limitation of the soil as a site for local roads and streets. Adapting the road design to the slope or land shaping and grading will help overcome the slope.

Wetness, slope, and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. A drainage system around the filter field with diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent. Placing distribution lines on the contour and using distribution boxes or other similar structures will increase the efficiency of the system on the slope.

Slope restricts this soil for most recreation uses. Some areas are used for hiking trails and picnic areas.

The capability subclass is IVe.

PuA—Punsit silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and somewhat poorly drained. It is in oval or rectangular areas, mainly at the base of long, gradual slopes. The areas range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam and 5 percent rock fragments

Subsoil:
6 to 11 inches, grayish brown silt loam with yellowish brown mottles and about 10 percent rock fragments
11 to 23 inches, gray gravelly loam with yellowish brown mottles and about 20 percent rock fragments

Substratum:
23 to 60 inches, very firm, olive gray loam with yellow mottles and about 10 percent rock fragments

Included with this soil in mapping are a few small areas of moderately well drained Pittstown soils and very poorly drained Alden soils. Pittstown soils are on slightly convex areas mainly at the edges of the unit. Alden soils are in slightly concave areas or narrow drainageways. Included soils make up 10 to 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: Moderate
Soil reaction: Slightly acid or moderately acid throughout
Erosion hazard: Slight
Depth to the seasonal high water table: 6 to 18 inches (February to April)
Root zone: Typically to a depth of 23 inches

Most areas of this soil are used for hay or pasture. A few areas are in cropland, and the rest are wooded.

This soil is moderately suited to crops. The seasonal high water table is the main limitation for most crops. It delays spring tillage and interferes with harvesting. Subsurface drains work well in this soil if an adequate outlet is established. Cover crops, conservation tillage, and crop rotations help to maintain the productivity of this soil.

This soil is moderately well suited to hay and pasture, especially to mixed hay and legumes if subsurface drains are installed. Grazing when the soil is too wet will compact the surface layer, destroying soil structure and damaging forage vegetation. Overgrazing reduces the quality and quantity of forage. Deferred and rotation grazing and lime and fertilizer will help maintain or increase the productivity of the pasture.

The potential productivity for northern red oak on this soil is moderately high. The seasonal high water table is the main limitation. It restricts root penetration, interferes with the operation of harvesting equipment during wet periods, and causes seedling mortality. Timber harvest is more easily accomplished during the dry season. Because roots are restricted by the substratum and the seasonal high water table, some trees are blown over during windstorms.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around

footings and foundations, and sealing the foundation will reduce wetness.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

Wetness is the main limitation of the soil for recreation uses. Subsurface drains and interceptor drains will improve the suitability for playgrounds, campgrounds, and picnic areas, especially if use is limited to the drier times of the year.

The capability subclass is IIIw.

PuB—Punsit silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and somewhat poorly drained. It is on oval or rectangular areas, mainly at the base of long, gradual slopes. The areas range from 5 to 20 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam and 5 percent rock fragments

Subsoil:
6 to 11 inches, grayish brown silt loam with yellowish brown mottles and about 10 percent rock fragments
11 to 23 inches, gray gravelly loam with yellowish brown mottles and about 20 percent rock fragments

Substratum:
23 to 60 inches, very firm, olive gray loam with yellow mottles and about 10 percent rock fragments

Included with this soil in mapping are a few small areas of moderately well drained Pittstown soils and very poorly drained Alden soils. Pittstown soils are on slightly convex areas mainly at the edges of the unit. Alden soils are in slightly concave areas or narrow drainageways. Included soils make up 10 to 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: Moderate
Soil reaction: Slightly acid or moderately acid throughout
Erosion hazard: Moderate
Depth to the seasonal high water table: 6 to 18 inches (February to April)
Root zone: Typically to a depth of 23 inches

Most areas of this soil are used for hay or pasture. A few areas are in cropland, and the rest are wooded.

This soil is moderately suited to crops. The seasonal high water table is the main limitation. It delays spring tillage and interferes with harvesting. Subsurface drains are well suited to this soil. Erosion will occur on cropland, especially at the upper limits of the slope range. Cover crops, conservation tillage, and crop rotations help to maintain soil productivity and reduce erosion.

This soil is moderately well suited to hay and pasture, especially to mixed hay and legumes if subsurface drains are installed. Grazing when the soil is too wet will compact the surface layer, destroying soil structure and damaging forage vegetation. Overgrazing reduces the quality and quantity of forage. Deferred and rotation grazing and lime and fertilizer will help to maintain or increase the productivity and reduce erosion.

The potential productivity for northern red oak on this soil is moderately high. The seasonal high water table is the main limitation. It restricts root penetration, interferes with the operation of harvesting equipment during wet periods, and causes seedling mortality. Timber harvest is more easily accomplished during the dry season. Because roots are restricted by the substratum and the seasonal high water table, some trees are blown over during windstorms.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Wetness and frost action are the main limitations of

the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

Wetness is the main limitation for recreation uses. Subsurface drains and interceptor drains will improve the suitability for playgrounds, campgrounds, and picnic areas, especially if use is limited to the drier times of the year.

The capability subclass is IIIw.

PuC—Punsit silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and somewhat poorly drained. It is on hilltops and hillsides and at the base of more sloping landforms. The areas are irregularly shaped. They range from 5 to 25 acres. Slopes are smooth and uniform.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam and about 5 percent rock fragments

Subsoil:
6 to 11 inches, grayish brown silt loam with yellowish brown mottles and about 10 percent rock fragments
11 to 23 inches, gray gravelly loam with yellowish brown mottles and about 20 percent rock fragments

Substratum:
23 to 60 inches, very firm, olive gray loam with yellow mottles and about 10 percent rock fragments

Included with this soil in mapping are a few small areas of moderately well drained Pittstown soils and very poorly drained Alden soils. Pittstown soils are on slightly convex areas and high spots. Alden soils are in slightly concave areas and in narrow drainageways. Included soils make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow in the substratum
Available water capacity: Moderate
Soil reaction: Slightly acid or moderately acid throughout
Erosion hazard: Moderate
Depth to the seasonal high water table: 6 to 18 inches (February to April)
Root zone: Typically to a depth of 23 inches

Most areas of this soil are used for hay or pasture. The other areas are in crops or are wooded.

This soil is moderately suited to cropland. The seasonal high water table and the erosion hazard are the main limitations. Seasonal wetness delays spring tillage and interferes with harvesting in some years. Subsurface drains and interceptor drains work well to improve the suitability. Cover crops, conservation tillage, cross-slope tillage, and crop rotations help to maintain soil productivity and reduce soil erosion.

This soil is moderately well suited to hay and pasture, especially to mixed hay and legumes if subsurface drains are installed. Grazing when the soil is too wet will compact the surface layer, destroying soil structure and damaging forage vegetation. Overgrazing reduces the quality and quantity of forage. Deferred and rotation grazing and lime and fertilizer will help to maintain or increase the productivity and reduce erosion.

The potential productivity for northern red oak on this soil is moderately high. The seasonal high water table and the substratum restrict tree root penetration, interfere with the operation of harvesting equipment during wet periods, and cause seedling mortality. Erosion is especially severe unless access roads and log skidding trails are constructed across the slope. Timber harvesting is more easily accomplished during the dry season. Some shallow-rooted trees are uprooted during windstorms.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Wetness and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will

reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

Seasonal wetness is the main limitation of the soil for most recreation uses. Subsurface drains and interceptor drains will reduce wetness sufficiently for playgrounds, campgrounds, or picnic areas, especially if the use is during the drier times of the year. Reshaping the slope of some recreation areas is necessary. Reseeding graded and filled areas as quickly as possible helps to reduce erosion.

The capability subclass is IIIe.

Ra—Raynham very fine sandy loam. This soil is very deep, nearly level, and poorly drained. It is on broad, flat lowlands. The areas of this soil are rectangular, linear, or irregular in shape and range from 5 to 100 acres. Slopes are generally smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, dark grayish brown very fine sandy loam

Subsoil:
10 to 16 inches, grayish brown very fine sandy loam with olive brown and strong brown mottles
16 to 21 inches, yellowish brown very fine sandy loam with grayish brown mottles

Substratum:
21 to 40 inches, grayish brown very fine sandy loam with strong brown mottles
40 to 60 inches, light brownish gray silt and dark grayish brown very fine sand

Included with this soil in mapping are small areas of moderately well drained Scio soils and very poorly drained Birdsall soils. Scio soils are on the slightly higher positions and make up about 5 percent of the unit. Birdsall soils are in depressions and along drainageways and make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate or moderately slow in the surface layer and subsoil and slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer and subsoil and moderately acid to mildly alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 6 inches to 2 feet (November to May)
Root zone: Unrestricted
Shrink-swell potential: Low

Most areas of this soil are in crops or woodland. A few areas are pasture. Where drained, this soil is classified as prime farmland.

This soil is suited to cultivated crops if it is drained. Seasonal wetness delays tillage in the spring, and subsurface drains will improve soil moisture conditions in the spring and fall. In some areas an outlet for the drains is difficult to establish because of the lack of slope. Wrapping tile drains prevents very fine sand from plugging drains. Cover crops and crop residue in and on the soil increase organic matter content and improve soil quality.

This soil is moderately suited to hay and pasture. The seasonal high water table restricts the root growth for some forage legumes. Grazing when the soil is too wet will compact the surface layer and damage vegetation. Deferred and rotation grazing, lime and fertilizer, and weed and brush control will help increase the quality and quantity of forage.

This soil has moderate potential productivity for red maple. Seasonal wetness causes high seedling mortality and restricts root penetration, and some trees are easily uprooted during windy periods. The seasonal wetness also restricts the use of heavy timber harvesting equipment to dry times of the year.

Wetness is the main limitation of the soil as a site for dwellings with basements and for local roads and streets. Constructing roads on raised fill material and installing a drainage system will reduce the effects of wetness.

Wetness and the permeability in the substratum are the main limitations of this soil as a site for septic tank absorption fields. Special design is needed to prevent saturation and seepage in disposal areas.

The capability subclass is IIIw.

Sa—Saprists and Aquents, ponded. This unit consists of very deep, very poorly drained soils in impounded areas along the Hudson River, on lacustrine plains, and on till uplands. The water table is at or above the surface of these soils most of the year. Slopes range from 0 to 3 percent. Some areas consist of Saprists, some of Aquents, and some of both. The total acreage of this unit is about 60 percent Saprists, 30 percent Aquents, and 10 percent other soils. The areas are commonly 5 to 10 acres, but along the Hudson River some are as large as 100 acres.

Typically, Saprists have a mat of live roots 10 inches thick over 16 to 52 inches of black, well decomposed muck. Below the organic layers is a mixture of organic and mineral sediments consisting of varved layers of silt and clay or loamy sand.

Typically, Aquents have about a 12-inch-thick surface layer of fibrous roots and mixed organic matter over dark gray mucky silty clay to loamy sand containing 0 to 60 percent rock fragments. The substratum consists of stratified layers of silt and clay to loamy sand with 0 to 60 percent rock fragments.

Included with this unit in mapping are areas of frequently flooded or ponded Palms, Carlisle, Halsey, Limerick, and Alden soils. The included soils are in areas as large as 2 acres and make up about 10 percent of the unit.

Cattails, rushes, loosestrife, and phragmites are dominant on this unit, and there are few or no trees. The unit is difficult to drain because of a lack of adequate outlets. Frequent flooding and variability of the soil properties preclude the use of this unit for most purposes other than as pond sites and habitat for muskrat, beaver, and waterfowl.

The capability subclass is Vw.

ScA—Scio silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and moderately well drained. It is on broad areas of eroded flats. The areas are irregularly shaped. They range from 5 and 15 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, brown silt loam

Subsoil:
9 to 20 inches, light olive brown silt loam with brown mottles
20 to 31 inches, light olive brown silt loam with gray mottles

Substratum:
31 to 80 inches, olive, pinkish gray, and gray layers of very fine sand, clay, and silt

Included with this soil in mapping are small areas of well drained Unadilla soils, poorly drained Raynham soils, and very poorly drained Birdsall soils. Unadilla soils are on slightly higher convex areas and make up about 5 percent of the unit. Raynham and Birdsall soils are in slightly lower concave areas and in narrow drainageways. They make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil, moderately rapid to rapid in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil, strongly acid to mildly alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 2 feet (March to May)
Root zone: Typically to a depth of about 30 inches

Most areas of this soil are in hay or crops. The other areas are used for pasture or are wooded. This soil is classified as prime farmland.

This soil is well suited to cultivated crops. The seasonal high water table delays early spring tillage. A subsurface drainage system will reduce wetness and improve the suitability for spring tillage. Rotations with cover crops and legumes, conservation tillage, and crop residues in and on the soil will increase the organic content of the surface layer, improve soil structure, and increase soil moisture.

This soil is well suited to hay and pasture. The seasonal high water table restricts the root growth of some legumes. Grazing when the soil is too wet will compact the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferred and rotation grazing, lime and fertilizer, harvest at the proper stage of plant growth, and weed and brush control help to increase the quantity and quality of feed and forage.

The potential productivity of northern red oak on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. The soil is soft when wet, restricting the use of heavy equipment.

Seasonal wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better

suited as a site for dwellings without basements. Grading the land so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and adequately sealing the foundation will reduce wetness.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. There is a hazard of contamination of ground water in areas used as sites for septic systems.

The capability subclass is IIw.

ScB—Scio silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. It is on broad, gradual hillsides and long, gentle slopes, many of which are eroded. The areas are irregularly shaped. They range from 5 to 15 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, brown silt loam

Subsoil:
9 to 20 inches, light olive brown silt loam with brown mottles
20 to 31 inches, light olive brown silt loam with gray mottles

Substratum:
31 to 80 inches, olive, pinkish gray, and gray layers of very fine sand, clay, and silt

Included with this soil in mapping are small areas of well drained Unadilla soils, poorly drained Raynham soils, and very poorly drained Birdsall soils. Unadilla soils are on slightly higher convex areas and make up about 5 percent of the unit. Raynham and Birdsall soils are in slightly lower concave areas and in narrow drainageways. They make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil, moderately rapid to rapid in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil, strongly acid to mildly alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: 1.5 to 2 feet (March to May)
Root zone: Typically to a depth of about 30 inches

Most areas of this soil are in hay or crops. The other areas are used for pasture or are wooded.

This soil is well suited to cultivated crops. The seasonal high water table delays early spring tillage. A subsurface drainage system will reduce wetness and improve the suitability for spring tillage. Erosion on cultivated cropland is a hazard unless conservation practices are applied. Rotations with cover crops and legumes, conservation tillage, and crop residue in and on the soil will increase the organic matter content of the surface layer, improve soil structure, increase soil moisture, and reduce erosion.

This soil is well suited to hay and pasture. The seasonal high water table restricts the root growth of some legumes. Grazing when the soil is too wet will compact the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferred and rotation grazing, lime and fertilizer, harvest at the proper stage of plant growth, and weed and brush control help to increase the quantity and quality of feed and forage.

The potential productivity for northern red oak on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. The soil is soft when wet, restricting the use of heavy equipment.

Seasonal wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited as a site for dwellings without basements. Grading the land so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and adequately sealing the foundation will reduce wetness.

Frost action is the main limitation of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Wetness and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. There is a hazard of contamination of ground water in areas used as sites for septic systems.

The capability subclass is IIe.

Sh—Shaker loam. This soil is very deep, nearly level, and somewhat poorly drained. It is on eroded flatlands. The areas are irregularly shaped and range

from 5 to 40 acres. Slopes are smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 10 inches, dark grayish brown loam

Subsoil:
10 to 16 inches, light brownish gray loam with yellowish brown mottles
16 to 22 inches, light brownish gray fine sandy loam with yellowish brown mottles

Substratum:
22 to 49 inches, gray silty clay loam with yellowish brown, brown, and pinkish gray mottles
49 to 80 inches, gray stratified layers of silt and clay with yellowish brown, brown, and pinkish gray mottles

Included with this soil in mapping are a few small areas of moderately well drained Elmridge soils on slightly higher or convex areas and very poorly drained Birdsall and Canandaigua soils in drainageways or slightly lower areas. Inclusions make up about 15 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil and slow or very slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer and subsoil and moderately acid to mildly alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: Surface to 1.5 feet (November to May)
Root zone: Unrestricted

Most areas of this soil are in crops or are wooded. The other areas are in hay or pasture. Where drained, this soil is classified as prime farmland.

This soil is suited to crops if it is drained, especially by subsurface drains that remove water perched above the clayey substratum. Conservation tillage, crop rotations, and crop residue in and on the soil help to improve soil structure and productivity.

This soil is well suited to hay and pasture. Drainage improves field moisture conditions for harvest of hay and for grazing. If the soil is grazed when wet, the soil structure will be damaged, compaction will occur, and pasture grasses will be destroyed. Proper stocking rates, rotation grazing, brush and weed control, and fertilizer and lime will improve the quality and quantity of pasture forage.

This soil has high potential productivity for eastern white pine. The seasonal high water table causes high seedling mortality, makes operation of equipment difficult, and limits rooting so that some trees are blown over easily during windstorms.

Wetness is the main limitation of the soil as a site for dwellings with basements. The soil is better suited to dwellings without basements. Installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness. Erosion is a hazard during construction. Maintaining the plant cover during construction and establishing a plant cover soon after will reduce erosion.

Wetness, low strength, and frost action are the main limitations of the soil as a site for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and slow percolation are the main limitations of the soil as a site for septic tank absorption fields. Nearby soils that are more permeable and better drained are better suited to septic tank absorption fields. A drainage system around the filter field that has diversions to intercept runoff from higher areas will reduce wetness. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIw.

StB—Stockbridge silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on the tops of hills and drumlins and on gradual slopes of hills. The areas are generally oval or broad and mainly oriented north-south. The areas range from 5 to 50 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 17 inches, dark yellowish brown silt loam
17 to 29 inches, olive brown silt loam

Substratum:
29 to 60 inches, dark grayish brown gravelly silt loam

Included with this soil in mapping are small areas of moderately well drained Georgia soils, somewhat poorly drained Massena soils, and poorly drained to very poorly drained Sun soils. Georgia soils are in slightly lower positions. Massena soils are in shallow depressions, and Sun soils are in depressions and along drainageways. Included soils make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow or moderately slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and moderately acid to moderately alkaline in the substratum
Surface runoff: Moderate
Erosion hazard: Slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are used for farming. The other areas are in brush or woodland. This soil is classified as prime farmland.

This soil is well suited to cultivated crops. Conservation tillage and cover crops improve soil quality and reduce erosion.

This soil is also well suited to hay and pasture. Proper stocking rates, rotation grazing, and weed and brush control help to increase the quantity and quality of feed and forage.

The potential productivity for northern red oak on this soil is moderately high. Tree seedlings survive and grow well if competing vegetation is controlled.

This soil has few or no limitations as a site for dwellings with basements.

Frost action is the main limitation of the soil for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action.

Slow percolation is the main limitation of the soil as a site for septic tank absorption fields. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIe.

StC—Stockbridge silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. It is on hillsides and the sides of drumlins. The areas are generally long and narrow and oriented north-south. The areas range from 5 to 50 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 17 inches, dark yellowish brown silt loam
17 to 29 inches, olive brown silt loam

Substratum:
29 to 60 inches, dark grayish brown gravelly silt loam

Included with this soil in mapping are small areas of moderately well drained Georgia soils, somewhat poorly drained Massena soils, and poorly drained to very poorly drained Sun soils. Georgia soils are in slightly lower positions. Massena soils are in shallow depressions, and Sun soils are in depressions and along drainageways. Included soils make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow or moderately slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and moderately acid to moderately alkaline in the substratum
Surface runoff: Moderate to rapid
Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are in crops or woodland. The other areas are in pasture.

This soil is moderately suited to crops. Erosion is a limitation. A conservation tillage system that leaves crop residue on the surface after planting, contour farming, stripcropping, or a crop rotation with 1 or more years of close-growing crops will help control erosion (fig. 6).

This soil is moderately well suited to hay and pasture. Proper stocking rates, rotation grazing, and weed and brush control help to increase the quantity and quality of forage.

The potential productivity for northern red oak on this soil is moderately high. Tree seedlings survive and

Figure 6.—Stripcropping on Stockbridge silt loam, 8 to 15 percent slopes.

grow well if competing vegetation is controlled.

Slope is the main limitation of the soil as a site for dwellings with basements. Grading and shaping the slopes or designing the dwellings to conform to the natural slope of the land will help overcome the slope. Maintaining the plant cover and establishing a plant cover soon after construction will reduce erosion.

Frost action and slope are limitations of the soil as a site for local roads and streets. A coarse-grained fill material to frost depth will reduce frost action. Adapting the road design to the slope of the land or land shaping and grading will help overcome the slope.

Slow percolation is the main limitation of the soil as a site for septic tank absorption fields. Enlarging the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IIIe.

StD—Stockbridge silt loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and well drained. It is on the sides of hills and drumlins and along drainageways and small streams dissecting uplands. The areas are generally long and narrow and oriented north-south. They range from 5 to 50 acres. Slopes are mainly smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:

surface to 9 inches, dark brown silt loam

Subsoil:
9 to 17 inches, dark yellowish brown silt loam
17 to 29 inches, olive brown silt loam

Substratum:
29 to 60 inches, dark grayish brown gravelly silt loam

Included with this soil in mapping are small areas of moderately well drained Georgia soils and poorly drained to very poorly drained Sun Soils. Georgia soils are on slightly lower positions, and Sun soils are in depressions and along drainageways. Inclusions make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate in the surface and subsoil and slow or moderately slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and moderately acid to moderately alkaline in the substratum
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are in crops or woodland. The other areas are pastured.

This soil is poorly suited for cropland. Erosion is a major limitation. A conservation tillage system that leaves crop residue on the surface after planting, a crop rotation that includes several years of close-growing crops, and stripcropping and terraces will help control erosion.

This soil is moderately suited to hay and pasture. The areas of hayland are subject to erosion if the plant cover is sparse. Lime and fertilizer protect the soil from erosion by increasing the quality of feed and the density of plant cover. Proper stocking rates, rotation grazing, and weed and brush control help to increase pasture productivity.

The potential productivity for northern red oak on this soil is moderately high. Slope causes an erosion hazard and limits the use of equipment. Placing logging roads on the contour helps to reduce erosion.

Slope is the main limitation of the soil as a site for dwellings with basements. Grading and shaping the slopes or designing the dwellings to conform to the natural slope of the land will help overcome the slope. Maintaining the plant cover and establishing a plant cover soon after construction will reduce erosion.

Slope is the main limitation of the soil as a site for local roads and streets. Land shaping and grading and adapting the road design to the slope of the land will help to overcome this limitation.

Slow percolation and slope are the main limitations of the soil as a site for septic tank absorption fields. Placing distribution lines on the contour and using distribution boxes or other similar structures that promote even distribution of effluent will increase the efficiency of a system on the slopes. Increasing the size of the absorption field or the trenches below the distribution lines will increase the rate of absorption of effluent.

The capability subclass is IVe.

StE—Stockbridge silt loam, 25 to 35 percent slopes. This soil is very deep, steep, and well drained. It is on the sides of hills and drumlins and along drainageways and small streams dissecting uplands. The areas are generally long and narrow and oriented north-south. They range from 5 to 25 acres. Slopes are mainly smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 17 inches, dark yellowish brown silt loam
17 to 29 inches, olive brown silt loam

Substratum:
29 to 60 inches, dark grayish brown gravelly silt loam

Included with this soil in mapping are small areas of poorly drained to very poorly drained Sun soils along drainageways. Also included are areas where shale or limestone bedrock is at or near the surface. Inclusions make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil and slow to moderately slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and moderately acid to moderately alkaline in the substratum
Surface runoff: Rapid

Erosion hazard: Very severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Most areas of this soil are wooded. A few areas are in crops or pasture.

This soil is generally not suited to cultivated crops. Slopes are too steep for the safe operation of equipment.

This soil is poorly suited to pasture because of the slope. Proper stocking rates, rotation grazing, and weed and brush control help to increase productivity and reduce erosion.

The potential productivity for northern red oak on this soil is moderately high. Slope causes an erosion hazard and limits the use of equipment. Placing logging roads on the contour helps to reduce erosion.

Slope is the main limitation of the soil as a site for dwellings with basements and for local roads and streets. Slow percolation and slope are the main limitations for septic tank absorption fields.

The capability subclass is VIe.

SuB—Stockbridge-Farmington silt loams, undulating. This unit consists of soils on and between small hills and ridges. The Stockbridge soils are between the hills, and the Farmington soils are on the hilltops and ridges. Slopes are complex, and range from 1 to 6 percent. The areas of the unit range from 5 to 25 acres and are broad or irregular in shape. Many are oriented north-south. They consist of 50 percent very deep, well drained Stockbridge soils; 30 percent shallow, well drained to somewhat excessively drained Farmington soils; and 20 percent other soils. The Stockbridge and Farmington soils are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Stockbridge soils are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 17 inches, dark yellowish brown silt loam
17 to 29 inches, olive brown silt loam

Substratum:
29 to 60 inches, dark grayish brown gravelly silt loam

The typical sequence, depth, and composition of the layers of the Farmington soils are as follows—

Surface layer:
surface to 8 inches, dark brown silt loam

Subsoil:
8 to 16 inches, brown silt loam

Bedrock:
16 inches, hard gray limestone

Included with this unit in mapping are areas of rock outcrop, somewhat poorly drained Massena soils, and poorly drained to very poorly drained Sun soils. Massena soils are in shallow depressions. Sun soils are in depressions and along drainageways.

Properties of the Stockbridge soils—

Permeability: Moderate in the surface layer and subsoil and moderately slow to slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and moderately acid to moderately alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Properties of the Farmington soils—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Strongly acid to slightly acid in the surface layer and moderately acid to mildly alkaline in the subsoil
Surface runoff: Medium
Erosion hazard: Slight
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically extends to bedrock at a depth of about 16 inches.

Most areas of this unit are cropland or pasture. The other areas are wooded.

This unit is moderately suited to cultivated crops. Most fields have islands of rock outcrop which are not cultivated and which hinder tillage. Droughtiness limits plant growth in areas of Farmington soils. Conservation tillage, cover crops, and crop residue in and on the soil increase organic matter content and improve soil quality.

This unit is moderately well suited to hay and pasture. Proper stocking rates, rotation grazing, and

weed and brush control help to increase the quality and quantity of forage.

The potential productivity for sugar maple on this unit is moderate. The main limitations for trees on the Farmington soils are the depth to bedrock, the rock outcrops, and a high seedling mortality. Bedrock restricts rooting depth, causing the uprooting of some trees during high winds.

The Stockbridge soils are generally unstable as sites for dwellings with basements and for local roads and streets. The depth to bedrock in the Farmington soils is a limitation for dwellings with basements and for local roads and streets.

The main limitations of the unit as a site for septic tank absorption fields are slow permeability in the Stockbridge soils and depth to bedrock in the Farmington soils.

The capability subclass is IIIe.

SuC—Stockbridge-Farmington silt loams, rolling. This unit consists of soils on and between small hills and ridges. The Stockbridge soils are between the hills, and the Farmington soils are on the hilltops and ridges. Slopes are complex and range from 5 to 16 percent. The areas of the unit range from 5 to 200 acres and are broad or irregular in shape. Many are oriented north-south. They consist of 45 percent very deep, well drained Stockbridge soils; 30 percent shallow, well drained to somewhat excessively drained Farmington soils; and 25 percent other soils. The Farmington and Stockbridge soils are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Stockbridge soils are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 17 inches, dark yellowish brown silt loam
17 to 29 inches, olive brown silt loam

Substratum:
29 to 60 inches, dark grayish brown gravelly silt loam

The typical sequence, depth, and composition of the layers of the Farmington soils are as follows—

Surface layer:
surface to 8 inches, dark brown silt loam

Subsoil:
8 to 16 inches, brown silt loam

Bedrock:
16 inches, hard gray limestone

Included with this unit in mapping are areas of rock outcrop, somewhat poorly drained Massena soils, and poorly drained to very poorly drained Sun soils. Massena soils are in shallow depressions. Sun soils are in depressions and along drainageways.

Properties of the Stockbridge soils—

Permeability: Moderate in the surface layer and subsoil and moderately slow to slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and moderately acid to moderately alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Properties of the Farmington soils—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Strongly acid to slightly acid in the surface layer and moderately acid to mildly alkaline in the subsoil
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically extends to bedrock at a depth of about 16 inches

Most areas of this unit are cropland or pasture. The other areas are wooded.

This unit is poorly suited to cultivated crops. Most fields have islands of rock outcrop which are not cultivated and which hinder tillage. Droughtiness limits plant growth in areas of Farmington soils. Erosion is the main limitation of Stockbridge soils. Conservation tillage, cover crops, and crop residue in and on the soil will help reduce erosion. Stripcropping also helps but is difficult to establish on complex slopes.

This unit is moderately well suited to hay and pasture. Proper stocking rates, rotation grazing, and weed and brush control help to increase the quality and quantity of forage.

The potential productivity for sugar maple on this unit is moderate. The main limitations for trees on the Farmington soils are the depth to bedrock, the rock

outcrops, and a high seedling mortality. Bedrock restricts rooting depth, causing the uprooting of some trees during high winds.

Slope limits the Stockbridge soils as sites for dwellings without basements, but the Stockbridge soils are better suited than the Farmington soils. The Farmington soils are limited by the depth to bedrock. Land shaping and grading or designing the dwelling to conform to the natural slope of the land will help overcome the slope of the Stockbridge soils.

The slope of the Stockbridge soils and the depth to bedrock in the Farmington soils are the main limitations of the unit as a site for local roads and streets.

The main limitations for septic tank absorption fields are the slow permeability of the Stockbridge soils and the depth to bedrock in the Farmington soils.

The capability subclass is IVe.

SvD—Stockbridge-Farmington silt loams, hilly, very rocky. This unit consists of soils on and between hills and ridges. The Stockbridge soils are between the hills and ridges, and the Farmington soils are on the hills and ridges. The areas of the unit range from 5 to 25 acres and are irregular in shape or long and narrow and are oriented north-south. Slopes are complex and range from 10 to 30 percent. The areas of this unit consist of 45 percent very deep, well drained Stockbridge soils; 30 percent shallow, well drained to somewhat excessively drained Farmington soils; 2 to 10 percent exposed bedrock; and 15 to 23 percent other soils. The soils of this unit and the areas of rock outcrop are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Stockbridge soils are as follows—

Surface layer:
surface to 9 inches, dark brown silt loam

Subsoil:
9 to 17 inches, dark yellowish brown silt loam
17 to 29 inches, olive brown silt loam

Substratum:
29 to 60 inches, dark grayish brown gravelly silt loam

The sequence, depth, and composition of the layers of the Farmington soils are as follows—

Surface layer:
surface to 8 inches, dark brown silt loam

Subsoil:
8 to 16 inches, brown silt loam

Bedrock:
16 inches, hard gray limestone

Included with this unit in mapping are small areas of somewhat poorly drained Massena soils and poorly drained to very poorly drained Sun soils. Massena soils are in shallow depressions. Sun soils are in depressions and along drainageways.

Properties of the Stockbridge soils—

Permeability: Moderate in the surface layer and subsoil and moderately slow in the substratum
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and moderately acid to moderately alkaline in the substratum
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Unrestricted

Properties of the Farmington soils—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Strongly acid to slightly acid in the surface layer and moderately acid to mildly alkaline in the subsoil
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at a depth of 16 inches

Most areas of this unit are pasture or woodland. Some areas are cropland.

This unit is generally not suited to cultivated crops. Erosion and the short, steep slopes, which restrict the use of equipment and the design of conservation systems, are the main limitations. The rock outcrops also limit equipment use and management of the soils.

This unit is poorly suited to pasture. Proper stocking rates, rotation grazing, and weed and brush control help to increase the quantity and quality of forage.

The potential productivity for sugar maple on this unit is moderate. The main limitations are the slope, the depth to bedrock, and the rock outcrops. Seedling mortality is high, and the use of heavy equipment is

limited. Bedrock restricts rooting, causing the uprooting of some trees during high winds.

The depth to bedrock and the slope are the limitations of Farmington soils as sites for dwellings with basements. Slope is the main limitation of the Stockbridge soils. The less sloping areas of the unit, especially in the Stockbridge soil, are better suited to dwellings with basements. The less sloping areas of Farmington soils are better suited to dwellings without basements than to those with basements. Dwellings in the less sloping areas of both soils require some landscaping and grading to overcome the slope. Maintaining the plant cover and using erosion-control structures during construction will reduce erosion.

Slope in both soils and the depth to bedrock in the Farmington soils are limitations for local roads and streets. Placing roads in less sloping areas of the Stockbridge soils will minimize excavation and removal of bedrock.

The capability subclass is VIs.

Sw—Sun silt loam. This soil is very deep, nearly level, and very poorly drained and poorly drained. It is in drainageways adjacent to hillsides and between slopes. The areas are long and narrow. They range from 5 to 40 acres. Slopes are smooth and uniform and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 8 inches, very dark grayish brown silt loam

Subsoil:
8 to 16 inches, gray loam with olive and yellowish brown mottles and about 10 percent rock fragments
16 to 25 inches, grayish brown sandy loam with olive and yellowish brown mottles and about 10 percent rock fragments

Substratum:
25 to 60 inches, grayish brown gravelly loam with olive brown mottles and about 20 percent rock fragments

Included with this soil in mapping are a few small areas of moderately well drained Georgia soils and somewhat poorly drained and poorly drained Massena soils. The included soils are on small convex areas in various parts of the unit and make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and slow or very slow in the subsoil and substratum
Available water capacity: High
Soil reaction: Strongly acid to slightly acid in the surface layer, moderately acid to neutral in the subsoil, and neutral to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Seasonal high water table: 1 foot above the surface to 6 inches below the surface (November to April)
Root zone: Typically to a depth of about 16 inches

Most areas of this soil are in woodland.

This soil is poorly suited to cultivated crops. The high water table is the main limitation. Because this soil generally is adjacent to better drained soils, it often provides an outlet for surface drains and tile drains from the adjacent soils.

This soil is moderately suited to hay and pasture. The high water table restricts root growth for most pasture grasses and legumes. Grazing when the soil is wet causes compaction of the surface layer and damages the desirable pasture plants.

The potential productivity for red maple on this soil is moderate. The prolonged high water table restricts rooting, resulting in a severe windthrow hazard, and it causes severe seedling mortality. The soil is wet and soft most of the year and is often accessible only when it is frozen.

The high water table is the main limitation of this soil as a site for dwellings with basements. Extensive drainage and sealing of basement walls are required to protect against water damage.

The high water table and the permeability in the subsoil and substratum are the main limitations of this soil as a site for septic tank absorption fields. Special design is necessary to prevent saturation and seepage in disposal areas.

The seasonal high water table limits this soil for most recreation uses. A few areas are suitable as wetland wildlife habitat.

The capability subclass is IVw.

TmF—Taconic-Macomber association, very steep, very rocky. This unit consists of shallow soils and moderately deep soils on the sides of mountains at an elevation of 1,000 feet or more. The Taconic soils are on the steepest parts of the mountainous landscapes, mainly adjacent to ledges and rock outcrops. The Macomber soils are commonly in shallow concave areas and lower parts of the mountainsides. The areas

of this unit are irregularly shaped. The unit consists of about 50 percent somewhat excessively drained Taconic soils, 35 percent well drained Macomber soils, 10 percent exposed bedrock, and 5 percent other soils. Slopes range from 35 to 45 percent.

The typical sequence, depth, and composition of the layers of the Taconic soils are as follows—

Surface layer:
0 to 6 inches, brown channery silt loam

Subsoil:
6 to 14 inches, yellowish brown very channery silt loam

Bedrock:
14 inches, hard, folded shale

The surface of the Macomber soils is covered by partially decomposed leaf litter and organic matter 2 inches thick. The typical sequence, depth, and composition of the layers of the Macomber soils are as follows—

Surface layer:
beneath the surface litter to about 6 inches, dark yellowish brown channery silt loam

Subsoil:
6 to 22 inches, light olive brown very channery loam

Bedrock:
22 inches, hard, folded shale

Included with this unit in mapping are a few small areas of very deep, well drained Lanesboro soils on convex slopes at the base of mountains and small areas of very deep, very poorly drained Aurelie soils in drainageways and impounded areas.

Properties of the Taconic soils—

Permeability: Moderate or moderately rapid
Available water capacity: Very low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Very severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to bedrock at 10 to 20 inches

Properties of the Macomber soils—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid throughout
Erosion hazard: Severe
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically extends to bedrock at a depth of 20 to 40 inches

Most areas of this unit are wooded. This unit is not suited to farming because of the slope, the rock outcrops, and droughtiness. The slope and rock outcrops limit the use of equipment and the design of conservation systems.

The potential productivity for sugar maple on this unit is moderate. Seedling mortality rates are high because of droughtiness. The restricted rooting results in severe windthrow. The slopes are too steep for safe operation of harvesting equipment, and skidding logs down slopes causes accelerated gully erosion.

The slope and the depth to bedrock limit this unit as a site for local roads and streets, dwellings, and septic tank absorption fields.

The capability subclass is VIIs.

Ud—Udipsamments, dredged. These soils are very deep, gently sloping, and excessively drained to well drained. They are on small islands, sandbars, and mounds where dredgings have been deposited along the Hudson River. Most areas are long and narrow. They range from 10 to 70 acres. Slopes are complex, are irregular, and range from 1 to 6 percent.

The general sequence, depth, and composition of layers of Udipsamments are as follows—

Surface:
0 to 10 inches, dark brown to light gray sand or loamy sand

Substratum:
10 to 60 inches, grayish brown to pale yellow sand and occasional strands of loamy sand or loamy fine sand

Included with Udipsamments in mapping are a few small areas of Fluvaquents and Udifluvents where tides inundate the edges of the sandy deposits. Inclusions make up about 10 percent of the unit.

Soil properties—

Permeability: Rapid
Available water capacity: Very low
Soil reaction: Strongly acid to mildly alkaline

Surface runoff: Slow
Erosion hazard: Moderate
Depth to the seasonal high water table: More than 6 feet
Root zone: Typically to a depth of about 5 inches

Most areas of this unit are in drought-tolerant vegetation. A few areas are used for access to the Hudson River.

Udipsamments are too droughty for farming and are inaccessible to farm equipment and livestock.

Udipsamments are loose and unstable and are unsuitable as sites for septic tank absorption fields. Excavations of any type in this unit are difficult and dangerous because of the instability. Some areas provide wildlife habitat.

A capability subclass is not assigned.

Ue—Udorthents, smoothed. This unit is very deep, nearly level, and excessively drained to moderately well drained. It is mostly in broad areas that range from 5 to 80 acres. Slopes are typically smooth and range from 0 to 3 percent.

Included with this unit in mapping are a few small areas of different types of soils. They make up about 10 percent of the unit.

Soil properties—

Permeability: Rapid to very slow
Available water capacity: Very low to high
Soil reaction: Extremely acid to moderately alkaline
Surface runoff: Slow or moderate
Erosion hazard: Slight
Depth to the seasonal high water table: Typically more than 3 feet
Root zone: 6 to 18 inches

Most areas of this unit are used for athletic fields, ramps and exchanges to major highways, and industrial parks. Onsite investigation is necessary to determine the suitability of the unit for any purpose.

A capability subclass is not assigned.

UnA—Unadilla silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and well drained. The areas are broad or irregular in shape and range from 5 to 25 acres. Slopes are generally smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 14 inches, yellowish brown silt loam
14 to 28 inches, light olive brown and olive brown very fine sandy loam

Substratum:
28 to 60 inches, light olive brown very fine sandy loam with yellowish brown mottles

Included with this soil in mapping are small areas of moderately well drained Scio soils and poorly drained Raynham soils. Scio soils are in the slightly lower areas. Raynham soils are in shallow depressions and along drainageways. Inclusions make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate throughout
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to mildly alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the water table: More than 72 inches
Root zone: Unrestricted

Most areas of this soil are cultivated cropland. The other areas are woodland or pasture. This soil is classified as prime farmland.

This soil is well suited to cultivated crops. Conservation tillage, cover crops, crop residue in and on the soil, and crop rotations increase organic matter content and improve soil quality.

This soil is well suited to hay and pasture. Proper stocking rates, rotation grazing, and weed and brush control help to increase the quantity and quality of feed and forage.

The potential productivity for sugar maple on this soil is moderate.

This soil has few or no limitations as a site for dwellings with basements and for septic tank absorption fields and recreation areas. Low strength limits it as a site for local roads and streets. This soil is soft when wet, causing the pavement to crack under heavy traffic. A coarse-grained subgrade or base material helps prevent damaged pavement caused by low strength.

The capability class is I.

UnB—Unadilla silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. The areas are generally irregular in shape and range

from 5 to 25 acres. Slopes are smooth.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 14 inches, yellowish brown silt loam
14 to 28 inches, light olive brown and olive brown very fine sandy loam

Substratum:
28 to 60 inches, light olive brown very fine sandy loam with yellowish brown mottles

Included with this soil in mapping are small areas of moderately well drained Scio soils and poorly drained Raynham soils. Scio soils are in the slightly lower areas. Raynham soils are in shallow depressions and along drainageways. Inclusions make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate throughout
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to mildly alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Moderate
Depth to the water table: More than 72 inches
Root zone: Unrestricted
Shrink-swell potential: Low

Most areas of this soil are cultivated cropland. The other areas are woodland or pasture.

This soil is well suited to cultivated crops. Erosion is a moderate limitation. Conservation tillage, cover crops, crop residue in and on the soil, and crop rotation systems increase organic matter content, improve soil structure, and reduce erosion.

This soil is well suited to hay and pasture. Proper stocking rates, rotation grazing, and weed and brush control help to increase the quantity and quality of feed and forage.

The potential productivity for sugar maple on this soil is moderate.

This soil has few or no limitations as a site for dwellings with basements and for septic tank absorption fields and recreation areas. Low strength limits it as a site for local roads and streets. This soil is soft when wet, causing the pavement to crack under heavy traffic. A coarse-grained subgrade or base material helps prevent damaged pavement caused by low strength.

The capability subclass is IIe.

UnC—Unadilla silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. The areas are generally narrow and commonly dissected by perennial or intermittent drainageways. The areas range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 14 inches, yellowish brown silt loam
14 to 28 inches, light olive brown and olive brown very fine sandy loam

Substratum:
28 to 60 inches, light olive brown very fine sandy loam with yellowish brown mottles

Included with this soil in mapping are small areas of moderately well drained Scio soils and poorly drained Raynham soils. Scio soils are in the slightly lower areas. Raynham soils are in shallow depressions and along drainageways. Inclusions make up about 15 percent of the unit.

Soil properties—

Permeability: Moderate throughout
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to mildly alkaline in the substratum
Surface runoff: Medium
Erosion hazard: Severe
Depth to the water table: More than 72 inches
Root zone: Unrestricted
Shrink-swell potential: Low

Most areas of this soil are hayland or pasture. The other areas are woodland.

This soil is moderately suited to cultivated crops. A conservation tillage system that leaves crop residue on the surface after planting, contour farming and stripcropping, or a crop rotation with 1 or more years of grasses and legumes will reduce erosion.

This soil is moderately well suited to hay and

pasture. Proper stocking rates, rotation grazing, and weed and brush control help to increase the quantity and quality of feed and forage. Overgrazing will damage the plant cover and expose the soil to further erosion.

The potential productivity for sugar maple on this soil is moderate. Erosion is the main limitation and is accelerated by timber harvesting operations. Placing logging roads and skidding trails on the contour or across the slope helps to reduce gully erosion.

Slope and erosion are the main limitations of this soil as a site for dwellings with basements. Maintaining the plant cover as much as possible during construction and reseeding excavated and filled areas as quickly as possible help to control erosion. Land shaping and grading will help overcome the slope.

The slope and low strength of this soil are limitations for local roads and streets. This soil is soft when wet, causing the pavement to crack under heavy traffic. A coarse-grained subbase material helps prevent damaged pavement.

Slope is the main limitation of the soil as a site for septic tank absorption fields. Placing distribution lines on the contour and using drop boxes or other structures that ensure even distribution of effluent will enable the system to function more effectively on the slopes.

Slope is the main limitation for recreation uses. Some grading and reshaping is necessary for playgrounds or athletic fields. Quickly reseeding graded areas helps to reduce erosion.

The capability subclass is IIIe.

UnD—Unadilla silt loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and well drained. The areas are generally narrow and linear and conform to a dendritic drainage pattern. The areas range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 14 inches, yellowish brown silt loam
14 to 28 inches, light olive brown and olive brown very fine sandy loam

Substratum:
28 to 60 inches, light olive brown very fine sandy loam with yellowish brown mottles

Included with this soil in mapping are small areas of poorly drained Raynham soils along drainageways. They make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate throughout
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil and strongly acid to mildly alkaline in the substratum
Surface runoff: Rapid
Erosion hazard: Very severe
Depth to the water table: More than 72 inches
Root zone: Unrestricted

Most areas of this soil are woodland or brushland.

This soil is poorly suited to cultivated crops. Slope and the long, narrow configuration of the areas make operation of tillage and harvest equipment difficult. A conservation tillage system that leaves crop residue on the surface after planting and a crop rotation that includes several years of close-growing crops will reduce erosion.

This soil is moderately well suited to hay and pasture, but hayland is subject to erosion if the plant cover is sparse. Lime and fertilizer on pastures protect the soil from erosion by increasing the quality and quantity of grass cover. Proper stocking rates, rotation grazing, and weed and brush control help to increase pasture productivity and control erosion.

The potential productivity for sugar maple on this soil is moderate. Slope is the main limitation. Erosion is accelerated by timber harvesting operations. Placing logging access roads and skid trails across the slope or on the contour will reduce gully erosion.

Slope and erosion are the main limitations of the soil as a site for dwellings, local roads and streets, and septic tank absorption fields. Slope is the main limitation for most recreation uses.

The capability subclass is IVe.

UrB—Urban land-Hudson-Vergennes complex, undulating. This unit consists mainly of areas where 90 percent or more of the surface is covered with pavement or buildings and of very deep, gently sloping soils. The main area of this unit is in the city of Hudson and is about 200 acres. The areas of the unit consist of about 50 percent urban land, 20 percent Hudson soils, 20 percent Vergennes soils, and 10 percent other soils. The urban land and Hudson and Vergennes soils are so intermingled that it was not practical to map them separately. Slopes range from 1 to 6 percent.

The typical sequence, depth, and composition of the

layers of the Hudson soils are as follows—

Surface layer:
surface to 6 inches, dark brown silt loam

Subsurface layer:
6 to 10 inches, brown silt loam

Subsoil:
10 to 15 inches, dark brown silty clay loam with faint yellowish brown mottles and light gray coatings
15 to 26 inches, dark brown silty clay loam with reddish brown and light brownish gray mottles

Substratum:
26 to 45 inches, dark brown and gray layers of silty clay loam
45 to 60 inches, dark brown and gray layers of silty clay

The typical sequence, depth, and composition of the layers of the Vergennes soils are as follows—

Surface layer:
surface to 9 inches, brown silty clay loam

Subsurface layer:
9 to 12 inches, brown silty clay with brown mottles

Subsoil:
12 to 15 inches, brown clay with strong brown and light brownish gray mottles
15 to 26 inches, dark brown clay with light brownish gray mottles
26 to 29 inches, dark brown clay

Substratum:
29 to 60 inches, brown, yellowish brown, light gray, and reddish brown clay and silty clay

Included with this unit in mapping are a few small, slightly lower areas of somewhat poorly drained Kingsbury and Rhinebeck soils and small pockets of very poorly drained Livingston and Madalin soils in narrow drainageways.

Properties of the Hudson soils—

Permeability: Slow or very slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer and subsoil and strongly acid to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: 1.5 to 2 feet (November to April)
Root zone: Typically to a depth of 25 inches
Shrink-swell potential: Moderate

Properties of the Vergennes soils—

Permeability: Very slow or slow
Available water capacity: High
Soil reaction: Strongly acid to neutral in the surface layer, subsurface layer, and subsoil; neutral to moderately alkaline in the substratum
Surface runoff: Slow
Erosion hazard: Moderate
Depth to the seasonal high water table: 1 to 3 feet (December to May)
Root zone: Typically extends to a depth of about 25 inches
Shrink-swell potential: Moderate

Most areas of this unit are in shopping centers or covered by paved streets. A few areas are garden plots, flowerbeds, and lawns and parks.

Wetness is the main limitation of the unit as a site for dwellings with basements. Dwellings without basements are more suitable. Surface drains placed around the dwellings and interceptor drains placed upslope to divert runoff from higher areas will help to remove surface water. Drains placed around footings and backfilled with sand and gravel will lower the water table. Applying protective sealants to the foundation will help to reduce the risk of wet basements. There is an erosion hazard on this soil during construction. Maintaining the plant cover and establishing a plant cover on disturbed areas soon after construction will help reduce erosion.

Low strength and frost action are the main limitations for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action and improve soil strength.

A capability subclass is not assigned.

Wa—Walpole sandy loam. This soil is very deep, nearly level, and poorly drained to somewhat poorly drained. It is on low, sandy flatlands. The areas are round or irregularly shaped. They range from 5 to 40 acres. Slopes are smooth, are uniform, and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
surface to 11 inches, very dark grayish brown sandy loam

Subsoil:
11 to 20 inches, light brownish gray fine sandy loam with yellowish brown mottles

Substratum:
20 to 39 inches, olive gray loamy sand with yellowish red mottles
39 to 60 inches, light brownish gray loamy sand with olive brown mottles

Included with this soil in mapping are a few small areas of moderately well drained Castile soils and very poorly drained Palms and Carlisle mucks. Castile soils are in slightly higher, convex areas and make up about 5 percent of the unit. Palms and Carlisle soils are in concave areas mainly in the center of the unit and in the wettest areas. They make up about 10 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum
Available water capacity: High
Soil reaction: Very strongly acid to neutral throughout
Surface runoff: Slow
Erosion hazard: Slight
Depth to the seasonal high water table: Surface to 1 foot (November to May)
Root zone: Typically to a depth of 20 to 39 inches

Most areas of this soil are wooded. A few areas are used for hay, crops, or pasture. Where drained, this soil is classified as prime farmland.

This soil is moderately suited to cultivated crops. Seasonal wetness is the main limitation for most crops. Where drained, it is well suited to crops such as corn but is better suited to hay and pasture. Tile drains work well to reduce soil wetness, but outlets for drains are sometimes difficult to establish. Conservation tillage, crop rotations, and fertilizer will improve the quality and quantity of pastures.

The potential productivity for red maple on this soil is moderate. Seasonal wetness and restricted rooting are the main limitations. Use of heavy timber harvesting equipment is limited when the soil is wet. Harvesting is done more easily when the soil is dry or frozen. Some shallow-rooted trees are blown over during windy periods. Seedling mortality is severe.

Wetness is the main limitation of the soil as a site for dwellings with basements. Dwellings without basements are more suitable. Grading so that surface water moves away from the dwelling, installing interceptor drains to divert water from higher areas, placing drains around footings and foundations, and sealing the foundation will reduce wetness.

Wetness and frost action are the main limitations for local roads and streets. A coarse-grained subgrade or base material to frost depth will reduce frost action. Raised fill material and a drainage system will reduce wetness.

Wetness and poor filtering are the main limitations of the soil as a site for septic tank absorption fields. There is a hazard of contamination to ground water because of poor filtering.

The capability subclass is IIIw.

Prime Farmland

Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. Identification of prime farmland is a major step in meeting the Nation's needs for food and fiber.

The U.S. Department of Agriculture defines prime farmland as the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops while using acceptable farming methods. Prime farmland produces the highest yields and requires minimal amounts of energy and economic resources, and farming it results in the least damage to the environment.

An area identified as prime farmland must be used for producing food or fiber or must be available for those uses. Thus, urban and built-up land and water areas are not classified as prime farmland.

The general criteria for prime farmland are as follows: a generally adequate and dependable supply of moisture from precipitation or irrigation, favorable temperature and growing-season length, acceptable levels of acidity or alkalinity, few or no rocks, and permeability to air and water. Prime farmland is not excessively erodible, is not saturated with water for long periods, and is not frequently flooded during the growing season. The slope range is mainly from 0 to 6 percent. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

Prime farmland may now be in crops, pasture, woodland, or other land, but not urban and built-up land or water areas. It must either be used for producing food or fiber or be potentially available for these uses.

About 67,932 acres in the county, or nearly 17 percent of the total acreage, meets the soil requirements for prime farmland. The areas are throughout the county, but many are in major valleys. The crops grown on this land are mainly corn, small grains, hay, vegetable crops, and orchards.

The soil map units that make up prime farmland in Columbia County are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps in the back of this publication. The soil qualities that affect use and management are described in the section titled "Detailed Soil Map Units."

Some soils that have limitations—a high water table, flooding, or inadequate rainfall—qualify as prime farmland if these limitations are overcome by such measures as drainage, flood control, or irrigation. In table 5 the measures needed are shown in parentheses after the map unit name. Onsite evaluation is necessary to see if this limitation has been overcome by corrective measures.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Assisting with this section were James R. Calhoun, district conservationist, Soil Conservation Service; Kenneth Piester, general agriculture and field crops specialist, Cooperative Extension Service; J. Richard Dunbar, Agricultural Stabilization and Conservation Service; and Dr. Shaw Reid, Cornell University Agronomy Department.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Farmland covered more than 150,000 acres in Columbia County in 1974, according to the Census of Agriculture. Of this, about 97,000 acres was in cropland. Woodland and other land in farms comprised the remaining acreage *(14)*. The acreage in crops and pasture has increased slightly in the past 10 years after several decades of decline.

Erosion is a major hazard on about 80 percent of the farmland in Columbia County, according to a 1982 natural resource inventory *(11)*. The hazard of erosion is related to the length and percent of slope of the land, the texture of the soil, the amount and intensity of rainfall, and the type and density of the plant cover.

Loss of soil through erosion causes a loss of nutrients and water, a reduction in available water capacity, the formation of gullies on hillsides, the deterioration of tilth, and the sedimentation of streams and reservoirs.

Productivity is reduced when the surface layer is lost and increasing amounts of the subsoil are incorporated into the plow layer, especially in such fine textured soils as Rhinebeck and Hudson soils or in soils with a dense substratum, such as Bernardston and Pittstown soils. Erosion also reduces the productivity of droughty soils,

such as Hoosic and Blasdell soils, through loss of organic matter. Nassau, Manlius, and Farmington soils, which are shallow or moderately deep to bedrock, sometimes are permanently damaged by erosion. Silty soils, such as Unadilla, Collamer, and Scio soils, are susceptible to erosion.

A plant cover reduces runoff and increases water infiltration. Conservation tillage, no-till farming, cover crops, crop residue in and on the surface, and crop rotations help to reduce erosion on short, irregularly sloping soils, such as Blasdell, Knickerbocker, and Nassau soils. Contour tillage, stripcropping, and terraces and diversions are better suited to soils with smooth, long, uniform slopes, such as sloping Stockbridge and Georgia soils.

Control of runoff is generally needed to reduce erosion on soils with slopes of more than 3 percent. Hudson, Unadilla, Collamer, and Scio soils all have a high content of silt and are easily eroded. Maintaining sod on these soils reduces erosion by slowing down runoff and promoting infiltration.

The effectiveness of a particular combination of conservation practices differs on different soils. Moreover, different combinations can be equally effective on the same soil. A local representative of the Soil Conservation Service or Soil and Water Conservation District can assist in planning an effective combination of practices to reduce soil erosion.

Drainage is a major need on about 14 percent of the acreage considered potential cropland in Columbia County, according to a 1967 New York conservation inventory *(12)*. More recent studies indicate that as much as 40 percent of the acreage needs drainage. Some soils are so wet that the production of crops common in the area is generally not possible without extensive drainage. Examples of these poorly drained and very poorly drained soils are Palms, Carlisle, Alden, Madalin, Birdsall, Halsey, and Limerick soils. The extended periods of ponding and the difficulty in establishing an outlet for drainage makes these soils generally unsuited to crops.

Seasonal wetness interferes with early planting, growth, and harvest of most crops on somewhat poorly drained soils, such as Punsit, Massena, Raynham, Niagara, and Rhinebeck soils. Crops on these soils respond well to improved drainage. Yields on drained soils are often as high as those on naturally well drained soils.

Some areas of well drained and moderately well drained soils, such as Unadilla, Bernardston, Knickerbocker, and Stockbridge soils, have spots of wetter soils that require random subsurface drains to make management of fields more uniform.

Some areas of sloping soils, such as Pittstown, Georgia, and Ovid soils, have wet spots. Drainage on those soils can be improved by interceptor drains that divert surface runoff and subsurface seepage.

Design of a drainage system varies with the kind of soil. A combination of surface and subsurface drainage is needed in most poorly drained and very poorly drained soils. Surface drainage can include open ditches, land smoothing, and bedding. Subsurface drains generally are corrugated plastic tubing. Establishing drainage outlets is often difficult and expensive because of the low position of these soils on the landscape.

Drains must be more closely spaced in slowly permeable soils than in more permeable soils. Subsurface drainage is slow in such soils as Punsit, Rhinebeck, and Niagara soils. These soils may also require surface drainage. Rapidly permeable soils, such as Castile, Fredon, and Walpole soils, respond well to subsurface drainage if an adequate outlet can be established.

Information on drainage systems is available at the Columbia County Soil and Water Conservation District Office.

Surface stones, boulders, and outcrops of bedrock severely limit some soils for crops and pasture. They interfere with the operation of tillage and harvesting equipment. The stony soils are indicated on the soil map by a special symbol. Bernardston, Pittstown, Stockbridge, and Georgia soils are the main soils in this survey area that are stony enough to limit management. Farmington and Nassau soils are likely to have outcrops of bedrock that might interfere with tillage. Areas of soil sufficiently stony or rocky to be shown by special symbols on the soil map generally can be used only for permanent pasture, and even then fertilizing, reseeding, and mowing will be difficult.

Available water capacity in the soil is important for crops. Some soils in the county tend to be droughty. Sandy and gravelly soils, soils that have a restricting layer, such as a very dense substratum, and soils that are shallow or moderately deep over bedrock tend to have a low capacity for moisture storage. Gravelly Hoosic soils, sandy Knickerbocker soils, and shallow Nassau soils all have sufficiently low available water capacity so that in most years crops will be moisture stressed during the growing season. Maintaining or increasing the level of organic matter and improving soil structure increase the available water capacity of these

droughty soils. Green-manure crops, crop residue, and manure build up the level of organic matter and improve soil structure.

Soil tilth is an important factor in the emergence of seedlings, the infiltration of water, and the ease of cultivation. Soils with good tilth usually have granular structure and are porous.

Excessive tillage tends to reduce organic matter content and breaks down soil structure. Some very deep, well drained or excessively drained, coarse textured soils, such as Hoosic or Knickerbocker, can be tilled with little or no damage to tilth. However, wetter, fine textured and moderately fine textured soils—for example, Hudson, Rhinebeck, and Niagara soils—must be tilled at the proper moisture content to prevent deterioration of natural soil structure. Plowing or cultivating these soils when they are wet causes puddling and, when the soil is dry, surface crusting and clodding.

Fertility in the soils in the county is enhanced by lime and fertilizer. The amount needed depends on the natural content of lime and plant nutrients, the needs of the particular crop, and the level of desired yield. The organic matter content of the soil is one measure of fertility. The content in the surface layer of the soils in Columbia County averages about 3.5 percent. Poorly drained and very poorly drained soils, such as Alden, Sun, and Canandaigua soils, have a somewhat higher organic matter content.

Nitrogen is released from the organic matter, but much of it is in complex forms that cannot be used by plants until it is decomposed by microorganisms. Nitrogen fertilizer is needed to supplement the nitrogen from the organic matter in the soil. Management that builds up the supply or organic matter, such as the use of green-manure crops, sod crops, and crop residue, improves the natural nitrogen content *(4)*.

Timeliness of nitrogen fertilization is important for maximum utilization by plants. Nitrogen can be lost through leaching in rapidly permeable soils, such as Hoosic soils, or by denitrification in wetter and less permeable soils, such as Rhinebeck soils. Best results are obtained when small amounts of nitrogen are applied at timely intervals; for example, at planting and then as a side dressing while the crop is growing.

The soils in Columbia County are generally low in natural phosphorus. Coarse textured Hoosic and Knickerbocker soils, for example, are very low in phosphorus. The addition of appropriate amounts of phosphate in the form of commercial fertilizer is essential for good plant growth.

Most of the soils have a low to medium level of available potassium, but such soils as Hudson, Rhinebeck, and Madalin soils, which have a clayey subsoil, are somewhat higher in potassium content. Even soils that have a fairly high content of potassium, however, require additional potassium for optimum yields of most crops.

Lime is needed in most of the soils in the survey area to raise the pH to an acceptable level for optimum yields of most crops.

Additions of lime and fertilizer should be based on soil tests. For assistance in obtaining soil tests and recommendations, farmers and others should consult their local Cooperative Extension Agent. New research findings and fertilizer recommendations are available in the current edition of "Cornell Recommends for Field Crops," prepared by the staff of the New York College of Agriculture, Cornell University *(4)*. In the absence of soil tests, these references, along with this publication, can be used as a guide in determining lime and fertility needs.

Special crops, including vegetable and orchard crops, are an important part of agriculture in Columbia County. Orchard crops are grown on various kinds of soil, mostly in the vicinity of the Hudson River where climatic factors are favorable. Apples are the principal orchard crop of commercial importance. There is also a small acreage of pears and peaches.

The most recent information and suggestions for growing orchard and vegetable crops and the estimated potential yields of these crops can be obtained from the local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper

planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. The levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, or *s*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and *s* shows that the soil is limited mainly because it is shallow, droughty, or stony.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w* or *s* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

This section was prepared by Robert E. Smith, Jr., staff forester. Assistance was provided by the New York State Department of Environmental Conservation Foresters and the Columbia County Soil and Water Conservation District.

In 1980, approximately 217,000 acres in Columbia County, or 53 percent of the acreage, was classified as commercial forest *(13)*. This represents a 12 percent increase over the previous survey in 1968.

Oak-timber types cover the greatest area in the county, 103,000 acres. Northern hardwoods cover 71,000 acres, and mainly softwood types cover 43,000 acres. The oak types are generally on drier sites, on southern and western slopes, and on the tops of ridges. The northern hardwood type (beech, birch, maple) is more common on moister sites and northern and eastern slopes. Of the softwood types, hemlock is common on wet sites, such as along wetlands or drainageways, or on the lower third of the slope. The white pine sites are soils with a wide variety of drainage classes but are mainly on well drained soils and in old crop fields.

The total volume of sawtimber in 1980 in Columbia County was about 620 million board-feet, a 106 percent increase since the 1968 survey. This is due to the maturing of the forest stands and in growth from the poletimber size classes into the sawtimber size classes. Of the total, oaks make up the largest volume, about 231 million board-feet; other hardwoods, 134 million board-feet; white pine, 107 million board-feet; maple, 91 million board-feet; hemlock, 46 million board-feet; and other softwoods, 11 million board-feet.

The woodlands of Columbia County are throughout the county, but the greater concentration is in the eastern half, particularly at the higher elevations, and on the hills leading up to the Berkshires or near Massachusetts.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed in the table. The table gives the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, that the indicator species can produce. The larger the number, the greater the potential productivity. The number 1 indicates low productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 through 8, high; 9 through 11, very high; and 12 or more, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *R* indicates steep slopes; *X*, stones or rocks on the surface; *W*, excessive water in or on the soil; *T*, excessive alkalinity, acidity, sodium salts, or other toxic substances in the soil; *D*, restricted rooting depth caused by bedrock, hardpan, or other restrictive layer; *C*, clay in the upper part of the soil; *S*, sandy texture; and *F*, high content of rock fragments in the soil profile. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that erosion can occur as a result of site preparation or following cutting operations and where the soil is exposed, for example, roads, skid trails, fire lanes, and log handling areas. Forests that are abused by fire or overgrazing are also subject to erosion. The ratings for the erosion hazard are based on the percent of the slope and on the erosion factor K shown in table 16. A rating of *slight* indicates that no particular measures to prevent erosion are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

The proper construction and maintenance of roads, trails, landings, and fire lanes will help overcome the erosion hazard.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that equipment use normally is not restricted either in kind of equipment that can be used or time of year because of soil factors. If soil wetness is a factor, equipment use can be restricted for a period not to exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If soil wetness is a factor, equipment use is restricted for 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either in kind of equipment or season of use. If soil wetness is a factor, equipment use is restricted for more than 3 months.

Choosing the most suitable equipment and timing harvesting and other management operations to avoid seasonal limitations help overcome the equipment limitation.

Seedling mortality refers to the probability of death of naturally occurring or planted tree seedlings as influenced by kinds of soil or topographic conditions. The factors considered in rating the soils for seedling mortality are texture of the surface layer, depth and duration of the water table, rock fragments in the

surface layer, rooting depth, and aspect of the slope. A rating of *slight* indicates that under usual conditions the expected mortality is less than 25 percent. A rating of *moderate* indicates that the expected mortality is 25 to 50 percent. Extra precautions are advisable. A rating of *severe* indicates that the expected mortality is more than 50 percent. Extra precautions are important. Replanting may be necessary.

The use of special planting stock and special site preparation, such as bedding, furrowing, or surface drainage, can help reduce seedling mortality.

Windthrow hazard is the likelihood of trees being uprooted (tipped over) by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions are a seasonal high water table and bedrock or a fragipan or other limiting layer. A rating of *slight* indicates that normally no trees are blown down by the wind. Strong winds may break trees but do not uproot them. A rating of *moderate* indicates that moderate or strong winds occasionally blow down a few trees during periods of soil wetness. A rating of *severe* indicates that moderate or strong winds may blow down many trees during periods of soil wetness.

The use of specialized equipment that does not damage surficial root systems during partial cutting operations can help reduce windthrow. Care in thinning or no thinning also can help reduce windthrow.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Except for those given for northern red oak on Bernardston soils, the site indices are estimates. Common trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, represents an expected volume produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced on a fully stocked, even-aged, unmanaged stand. One cubic meter per hectare equals 14.3 cubic feet per acre.

The first tree species listed under common trees for a soil is the indicator species for that soil. The indicator species is the species that is common in the area and is generally the most productive on the soil. The productivity class of the indicator species is the number used for the ordination symbol.

Trees to plant are those that are suited to the soil and are planted for commercial wood production. Some soils, such as Palms muck, are not suitable for commercial wood production. No species names are specified for these soils in this column.

Recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking

areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

This section was prepared by Robert E. Myers, staff biologist, Syracuse, New York.

Columbia County is in two wildlife habitat zones, the Hudson River Valley in the west and the Taconic Highlands in the east.

The fertile, rolling Hudson River Valley supports fruit, vegetable, and crop production and is the site for cropland, hayland, and pasture for dairy farms. The forest areas are small and consist of oak-northern hardwoods species. There are a few wetlands along the Hudson River and its tributaries.

The land use pattern in the valley creates habitat for white-tailed deer, gray squirrel, cottontail rabbit, red fox, coyote, and a variety of songbirds. The zone is part of New York's secondary ring-necked pheasant range; however, only a few pheasants inhabit the county. A population of wild turkey is developing in this zone. Migratory and nesting waterfowl, mink, and muskrats are common.

The Taconic Highlands are rolling and hilly. Their elevation increases in the areas near and on the eastern edge of the Taconic Mountains. Dairy farming is extensive at the lower elevations and in the valleys. The ridges are heavily wooded with oak and oak-pine northern hardwoods. Red maple-elm swamps are around many ponds and in low areas. To the east, closer to the mountains, is an increasing amount of land that was cropped but is now in second-growth hardwoods.

The land use pattern in the highlands provides habitat for a variety of wildlife species. The oaks and farmlands are excellent habitat for wild turkey and gray squirrel. Rabbit, coyote, red fox, and deer are abundant in the farming region, and gray fox are in the more heavily wooded portions. Migrating and nesting waterfowl are common around the ponds and wetlands at the lower elevations. Songbirds are common throughout the zone.

Raccoon, striped skunk, and opossum are common throughout the county.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining wildlife

habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, timothy, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggartick, quackgrass, and ragweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, birch, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are gray dogwood, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, yew, cedar, and hemlock.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, arrowhead, burreed, pickerelweed, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, swamps, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include kestrel, meadow vole, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, frogs, and tree swallow.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a

high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation

can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts,

sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in

parentheses, is given in table 18.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very

high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

Some soils in table 17 are assigned to two hydrologic soil groups. Dual grouping is used for one of two reasons: (1) Some soils have a seasonal high water table but can be drained. In this instance the first letter applies to the drained condition of the soil and the second letter to the undrained condition. (2) In some soils that are less than 20 inches deep to bedrock, the first letter applies to areas where the bedrock is cracked and pervious and the second letter to areas where the bedrock is impervious or where exposed bedrock makes up more than 25 percent of the surface of the soil.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable period of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under

normal weather conditions (there is more than a 50 percent chance of flooding in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely, thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely, grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table, that is, *perched, artesian,* or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table—Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Their Morphology." The soil samples were tested by the New York Department of Transportation, Bureau of Soil Mechanics.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM); and Linear shrinkage—T 92 (AASHTO), D 427 (ASTM).

Engineering Properties of Geologic Deposits

The following geologic deposits are in Columbia County: glacial till, outwash, ice-contact, lacustrine, alluvial, and organic. The engineering properties of each geologic deposit are influenced to a great extent by the mode of deposition, which in turn determines the texture of the material and the internal structure of the landform. Other influences are the position of the deposit on the landscape and the position of the water table. In Columbia County the geologic deposits are in the following categories: deep till, shallow-to-rock, stratified coarse-grained, stratified fine-grained, and organic.

Deep till deposits. These are unstratified, highly variable mixtures of all particle sizes ranging from rock fragments to clay. This material was scoured and transported from nearby sources by glacial ice and deposited as a ground moraine or end moraine. Bedrock is generally at a depth of more than 5 feet, but in some small areas this depth to rock is less or there are outcrops of bedrock. The rock and mineral fragments in the soil generally reflect the types of bedrock in an area.

Soils that formed in mixed deep till deposits are those of the Alden, Aurelie, Bernardston, Cazenovia, Georgia, Lanesboro, Massena, Monarda, Ovid, Pittstown, Stockbridge, and Sun series. These soils are the most dense and compact of the soils that formed in unconsolidated deposits in the county. Most of the till has been compacted by glacial ice. Deep till soils range from nearly level to very steep, but most are nearly level or gently sloping. Many landscapes are such that cut and fill earthwork is involved in most construction. The soils generally provide a stable, relatively incompressible foundation for engineering works. If properly compacted, fill material from these deposits generally provides stable embankments. Steep cut slopes often are subject to surface sloughing and erosion. The Alden and Aurelie soils are subject to ponding.

Shallow-to-rock deposits. These deposits contain a veneer of glacial till over bedrock. The soil is generally from 6 inches to 3 feet thick, and rock outcrops are common in some areas. The landforms and topography are generally controlled by the bedrock.

The Manlius and Nassau soils formed in glacial till deposits over shale. The Macomber and Taconic series formed in glacial till over slate or phyllite bedrock. The Farmington series soils formed in glacial till over limestone bedrock.

The primary engineering concerns are the underlying bedrock and ground water. Cut and fill earthwork is needed in some areas, but the quantity of fill material is limited by depth to bedrock.

Stratified coarse-grained deposits. These deposits consist of stratified gravel and sand sorted by glacial meltwater and of coarser materials deposited by fluvial action. They are on outwash plains and terraces, ice-contact kames and eskers, beach ridges, and the coarser portions of deltas, lacustrine plains, and flood plains. The material in these deposits is well sorted or poorly sorted, and particle sizes range from cobbles to silt. The deposits are mainly loose and porous, and their permeability is moderately rapid to rapid.

The Castile, Fredon, Halsey, Hoosic, Knickerbocker, and Walpole soils formed on gravelly outwash plains and terraces, beach ridges, deltas, kames, eskers, and fans. The Scio and Unadilla soils formed in silty material overlying coarse-grained materials on lake plains. Linlithgo and Occum soils formed in sandy flood-plain deposits.

Coarse-grained deposits generally have relatively high strength and low compressibility. Because of their loose and porous nature, most of these deposits are not highly erodible but are subject to settlement when vibrated. The Linlithgo and Occum soils are subject to flooding, and the Halsey soils are subject to ponding.

These deposits of gravel and sand have many uses as a construction material. Depending on gradation, soundness, and plasticity, they are suitable as:

1. Fill material for highway embankments.

2. Fill material for parking areas and developments.
3. Fill material to decrease stress on underlying soils so construction operations can proceed.
4. Subbase for pavements.
5. Wearing surfaces for driveways, parking lots, and some roads.
6. Material for highway shoulders.
7. Free-draining backfill for structures and pipes.
8. Outside shells of dams for impounding water.
9. Slope-protection blankets to drain and help stabilize wet cut slopes.
10. Sources of sand and gravel for general use.

Stratified fine-grained deposits. These deposits consist of lacustrine, fine-grained sediment transported by glacial meltwater and deposited in quiet proglacial lakes and ponds. Some are flood plains on more recent slackwater deposits. The deposits consist of distinct layers or laminations mainly of fine sand and silt- and clay-sized particles.

The Hudson, Madalin, and Rhinebeck soils formed in deep lake-laid silt and clay deposits. The Birdsall, Canandaigua, Collamer, Niagara, Raynham, and Scio soils formed on deep, silty areas of deltas. The Elmridge and Shaker soils formed in a coarse-grained veneer over fine-grained material.

Because of their fine texture and high moisture contents, these deposits have low strength. The soils with a large content of fine sand and silt have low compressibility but are highly erodible and susceptible to frost. The alluvial soils are prone to flooding, and the Madalin, Canandaigua, and Birdsall soils are subject to ponding.

The soils that formed in fine-grained deposits are difficult to use for engineering works, especially the nearly level, wet soils that are subject to ponding. Sites for embankments and heavy structures or buildings on all soils formed in these finer sediments must be investigated for strength and settlement and for the effects of ground water.

Organic deposits. These deposits are mainly accumulations of plant remains. In places there aresmall amounts of mineral soil. Organic deposits are in very poorly drained depressions and bogs covered with water most of the year. Carlisle and Palms soils and Saprists and Aquents formed in organic material. The soils in organic deposits are unsuitable as foundations for engineering works because they are wet, weak, and highly compressible. Generally the organic material should be removed and replaced with suitable backfill. Filling over organic deposits causes long-term settlement.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(9)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquept (*Aqu*, meaning water, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquepts (*Hapl*, meaning minimal horizonation, plus *aquept*, the suborder of the Inceptisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Aeric* identifies the subgroup that is better drained than is typical for the great group. An example is Aeric Haplaquepts.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, frigid Aeric Haplaquepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (8)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (9)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Alden Series

The Alden series consists of very deep, very poorly drained soils formed in dense glacial till. These soils are in small depressional areas and linear drainageways that are on upland glacial till plains. The areas are long and narrow or nearly round and range from 5 to 10 acres. Slopes are 0 to 3 percent.

The Alden soils are adjacent to well drained Bernardston soils, moderately well drained Pittstown soils, and somewhat poorly drained Punsit soils. The Alden soils have a mucky surface and are grayer and more distinctly mottled than any of those soils.

Typical pedon of Alden mucky silt loam, in the town of Copake, 150 feet south of the railroad tracks, 0.2 mile west of track intersection with County Route 7:

Ap—0 to 7 inches; black (10YR 2/1) mucky silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; slightly hard dry; very friable moist; nonsticky and nonplastic; many fine and medium roots; strongly acid; clear smooth boundary.

Bg1—7 to 11 inches; dark gray (10YR 4/1) silt loam; weak medium subangular blocky structure; few fine distinct yellowish brown (10YR 5/8) mottles; friable; slightly sticky, slightly plastic; few fine and medium roots; common very fine tubular pores; less than 1 percent rock fragments; slightly acid; abrupt smooth boundary.

Bg2—11 to 28 inches; gray (5Y 6/1) silt loam; weak coarse prismatic structure; many medium prominent olive yellow (2.5Y 6/6) and yellowish brown (10YR 5/5) mottles; friable; slightly sticky, slightly plastic; few roots; few very fine tubular pores; 5 percent rock fragments; moderately acid; clear smooth boundary.

C—28 to 60 inches; gray (N 5/0) gravelly loam; massive; common medium and coarse prominent yellowish brown (10YR 5/6 and 5/4) mottles; friable; slightly sticky, slightly plastic; few very fine tubular pores; 15 percent rock fragments; slightly acid.

The solum is 20 to 36 inches thick. The depth to bedrock is more than 5 feet. The content of rock fragments ranges from 0 to 15 percent in the solum and 5 to 35 percent in the substratum. Reaction is strongly acid to neutral in the surface layer, moderately acid to neutral in the subsoil, and slightly acid to moderately alkaline in the substratum.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is fine sandy loam, very fine sandy loam, loam, or silt loam.

The B horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 0 to 2. It is silt loam or very fine sandy loam and is mottled.

The C horizon has hue of 5YR to 5Y or is neutral, has value of 4 to 6, and has chroma of 0 to 2. The C horizon is fine sandy loam, silt loam, or silty clay loam or the gravelly analogs of those textures.

Aquents

Aquents consist of very deep, very poorly drained soils formed in deposits of lacustrine material, outwash, or glacial till. These soils have little or no profile development. They are in concave and impounded areas on the uplands. The slope range is 0 to 3 percent.

Aquents are mapped with Saprists. Saprists formed in organic material. Aquents are commonly near Alden, Halsey, Limerick, Palms, and Carlisle soils, which formed in more uniform deposits.

Because the soil deposits in Aquents are highly variable, a typical pedon is not provided.

Generally the solum thickness of Aquents is 2 to 15 inches. Bedrock is generally at a depth of more than 60 inches.

The surface layer has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 to 3. It is mottled in some pedons. The surface layer is loamy sand to silty clay or the gravelly and very gravelly analogs of those textures. Structure is granular, or the soils are massive. The content of rock fragments ranges from 0 to 50 percent. Reaction is strongly acid to mildly alkaline.

The substratum has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 or less. It is mottled in some pedons. It is loamy sand to silty clay or their gravelly and very gravelly analogs. The substratum is massive. The content of rock fragments ranges from 0 to 70 percent. Reaction is strongly acid to mildly alkaline.

Aurelie Series

The Aurelie series consists of very deep, poorly drained soils in drainageways and impounded areas on uplands at an elevation of at least 1,000 feet. The soils formed in acidic glacial till with a high content of shale fragments. They are in a frigid temperature regime. Slopes range from 0 to 3 percent.

Aurelie soils are similar to Alden and Sun soils. Alden soils formed in similar material but are in a mesic temperature regime. Sun soils formed in calcareous glacial till and are in a mesic temperature regime.

Typical pedon of Aurelie silt loam, in the town of Hillsdale, 800 feet south of West End Road, 1 mile east

of the intersection of Harlemville Road and West End Road:

A—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable; many fine and medium roots; 10 percent rock fragments; moderately acid; abrupt wavy boundary.
Bg1—6 to 14 inches; grayish brown (2.5Y 5/2) channery silt loam; common fine distinct dark yellowish brown (10YR 4/4) mottles and common fine prominent reddish brown (5YR 4/4) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; 15 percent rock fragments; moderately acid; clear wavy boundary.
Bg2—14 to 22 inches; olive gray (5Y 5/2) channery silt loam; many (25 percent) medium distinct strong brown (7.5YR 5/6) mottles and many (25 percent) fine and medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; 20 percent rock fragments; moderately acid; clear wavy boundary.
Cd—22 to 60 inches; grayish brown (2.5Y 5/2) channery silt loam; few fine distinct strong brown (7.5YR 5/6) mottles; massive; firm; 25 percent rock fragments; slightly acid.

The thickness of the solum is 12 to 22 inches. The content of rock fragments ranges from 10 to 50 percent in the A horizon and 5 to 25 percent in the B and Cd horizons.

Some pedons have an O horizon.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2. It is silt loam or loam. Reaction ranges from extremely acid to moderately acid.

Some pedons have an E horizon.

The B horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 to 4. It is loam, silt loam, or fine sandy loam. Reaction ranges from very strongly acid to slightly acid.

The Cr horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 4. It is loam, silt loam, or clay loam. Reaction is strongly acid to neutral.

Bernardston Series

The Bernardston series consists of very deep, well drained soils formed in deposits of dense glacial till. These soils are on uplands. Slopes range from 3 to 35 percent.

Bernardston soils are in a drainage sequence with and formed in the same kind of material as moderately well drained Pittstown soils, somewhat poorly drained Punsit soils, and very poorly drained Alden soils. Bernardston soils and Stockbridge soils formed in similar material, but Bernardston soils are more acid and have a denser substratum.

Typical pedon of Bernardston silt loam, 8 to 15 percent slopes, in the town of Hillsdale, 1,000 feet east of Hunt Road and 0.8 mile north of its intersection with N.Y. Route 22:

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable, nonsticky, nonplastic; many fine and very fine roots; 5 percent rock fragments; slightly acid; clear smooth boundary.
Bw1—8 to 15 inches; light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable, nonsticky, nonplastic; few fine roots; few fine vesicular pores; 10 percent rock fragments, mostly shale; moderately acid; clear smooth boundary.
Bw2—15 to 22 inches; light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure parting to weak fine granular; few medium faint dark brown (10YR 3/3) mottles; friable, nonsticky, nonplastic; few fine roots; few fine and very fine vesicular pores; 10 percent rock fragments, mostly shale; strongly acid; abrupt smooth boundary.
Cd1—22 to 42 inches; olive gray (5Y 4/2) channery silt loam; moderate medium platy structure; firm, slightly sticky, slightly plastic; many very fine tubular pores and common fine vesicular pores; 20 percent rock fragments; strongly acid; diffuse wavy boundary.
Cd2—42 to 60 inches; olive gray (5Y 5/2) channery silt loam; massive; firm, slightly sticky, slightly plastic; few very fine tubular pores; 20 percent rock fragments; strongly acid.

The thickness of the solum ranges from 15 to 30 inches. The content of rock fragments ranges from 0 to 50 percent in the A horizon and 10 to 35 percent in the B and C horizons. The soil ranges from very strongly acid to moderately acid, unless limed.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. It is loam or silt loam. Structure is weak or moderate, fine or medium granular. Consistence is friable or very friable.

The B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6. It is loam or silt loam and has moderate, fine or medium granular or fine or medium, subangular blocky structure.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 or 3. It is loam or silt loam in the fine

earth fraction. It has weak or moderate medium platy structure, or it is massive. It is firm to extremely firm.

Birdsall Series

The Birdsall series consists of very deep, very poorly drained soils formed in water-laid deposits of silt and very fine sand. These soils are on lake plains or in depressions on uplands. Slopes range from 0 to 3 percent.

Birdsall soils are in a drainage sequence with well drained Unadilla soils, moderately well drained Scio soils, and poorly drained Raynham soils. Birdsall soils have a grayer B horizon than any of those soils. Birdsall soils are similar to Canandaigua and Madalin soils but have less clay in the subsoil.

Typical pedon of Birdsall silt loam, in the town of Ghent, 600 feet west of N.Y. Route 9H and 4,900 feet south of the intersection of 9H and Rabbit Lane:

A—0 to 9 inches; very dark brown (10YR 2/2) silt loam; strong fine and medium granular structure; very friable; many fine and few medium roots; 25 percent iron nodules ¼ inch to 2 inches in diameter; neutral; clear smooth boundary.

Bg1—9 to 13 inches; grayish brown (10YR 5/2) silt loam; few fine faint yellowish brown (10YR 5/4) mottles; weak medium and fine subangular blocky structure parting to weak fine granular; friable; common fine roots; 29 percent iron nodules ¼ inch to 2 inches in diameter; slightly acid; abrupt smooth boundary.

Bg2—13 to 18 inches; grayish brown (2.5Y 5/2) silt loam; few fine prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure parting to weak fine granular; friable; 12 percent black (N 2/0) iron nodules ¼ inch to 2 inches in diameter; few fine roots; common fine vesicular pores; many fine tubular pores; slightly acid; abrupt smooth boundary.

Bg3—18 to 25 inches; gray (5Y 5/1) silt loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure; friable; 5 percent iron nodules; few fine roots; few fine vesicular pores; slightly acid; clear wavy boundary.

Cg1—25 to 35 inches; gray (5Y 5/1) very fine sandy loam; common coarse prominent yellowish red (5YR 4/6), brown (7.5YR 4/4), and strong brown (7.5YR 4/6) mottles; massive; friable; gray (N 6/0) vertical streaks; slightly acid; clear smooth boundary.

Cg2—35 to 46 inches; dark gray (5Y 4/1) loam; massive; friable; olive brown (2.5Y 4/4) stains; slightly acid; clear smooth boundary.

Cg3—46 to 60 inches; variegated dark gray (10YR 4/1), strong brown (7.5YR 5/6), grayish brown (2.5Y 5/2), and gray (N 5/0) varved silt, clay, and very fine sand; weak thin and medium platy structure within varves; friable; slightly acid.

The thickness of the solum and the depth to the varved material range from 14 to 30 inches. The soil ranges from very strongly acid to moderately acid in the A horizon and from strongly acid to neutral in the Bg and Cg horizons. The content of rock fragments ranges from 0 to 3 percent.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. Some pedons have a muck or peat surface layer up to 4 inches thick. The A horizon is silt loam or very fine sandy loam.

The Bg horizon has hue of 2.5Y or 5Y, value of 4 to 7, and chroma of 0 to 2, and it is mottled. It is silt loam or very fine sandy loam.

The Cg horizon has hue of 2.5Y or 5Y, value of 4 to 7, and chroma of 0 to 2. It consists of varved layers of silt, silt loam, very fine sandy loam, or loamy very fine sand.

Blasdell Series

The Blasdell series consists of very deep, well drained soils formed in water-sorted materials dominated by shale fragments. The soils are on glacial outwash plains, kames, eskers, terraces, and alluvial fans. Slopes range from 0 to 35 percent.

Blasdell soils are near somewhat poorly drained and poorly drained Fredon soils, somewhat excessively drained Hoosic soils, shallow Nassau soils, loamy Stockbridge soils, and very poorly drained Palms and Carlisle soils.

Typical pedon of Blasdell channery loam, 0 to 3 percent slopes, in the town of Ghent, 100 feet east of County Route 9 and 1,100 feet south of the intersection of County Route 9 and Tice Hill Road:

Ap—0 to 10 inches; brown (10YR 4/3) channery loam; moderate medium subangular blocky structure; friable; common fine and medium roots; 30 percent shale fragments; strongly acid; abrupt smooth boundary.

Bw1—10 to 20 inches; yellowish brown (10YR 5/4) channery loam; moderate medium subangular blocky structure; friable; common fine roots; many fine tubular pores; 20 percent shale fragments; strongly acid; clear wavy boundary.

Bw2—20 to 30 inches; dark yellowish brown (10YR 4/4) very channery loam; very weak medium subangular blocky structure; very friable; few fine roots; 40 percent shale fragments; occasional sandstone ghosts; strongly acid; clear wavy boundary.

C1—30 to 40 inches; dark yellowish brown (10YR 4/4) extremely channery loam; massive; friable; 75 percent shale fragments, 19 percent more than 3 inches in diameter; strongly acid; clear wavy boundary.

C2—40 to 60 inches; dark brown (10YR 3/3) extremely channery silt loam; massive; friable; 75 percent shale fragments, 30 percent more than 3 inches in diameter.

The solum thickness ranges from 30 to 50 inches. Rock fragments are dominantly shale and make up 15 to 60 percent of the A horizon and upper part of the B horizon and 45 to 75 percent of the lower part of the B horizon and of the C horizons. Unless limed, the soil ranges from very strongly acid to moderately acid in the solum and strongly acid to slightly acid in the C horizon.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. It is loam or silt loam in the fine earth fraction and has medium granular or subangular blocky structure. Consistence is friable or very friable.

The B horizon has hue of 7.5YR to 2.5Y in the upper part and 10YR to 5Y in the lower part, value of 4 or 5, and chroma of 3 to 6. It contains high chroma mottles in some pedons. It is loam or silt loam in the fine earth fraction. The B horizon has very weak to moderate, fine or medium subangular blocky structure. Consistence is very friable to firm.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 4. It is loam or silt loam in the fine earth fraction. The C horizon is massive and friable or firm.

Canandaigua Series

The Canandaigua series consists of very deep, poorly and very poorly drained soils on lake plains. The soils formed in nonacid deposits of silt, very fine sand, and clay. Slopes range from 0 to 3 percent.

Canandaigua soils are in a drainage sequence with moderately well drained Collamer soils and somewhat poorly drained Niagara soils. Canandaigua soils are near Birdsall and Madalin soils and have more clay than Birdsall soils but less clay than Madalin soils.

Typical pedon of Canandaigua silt loam, in the town of Stuyvesant, 400 feet west of Maple Lane and 0.2 mile north of its intersection with Dahlgren Road:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

Bg1—8 to 15 inches; gray (10YR 6/1) silt loam; many medium distinct yellowish brown (10YR 5/8) mottles; few pockets of very dark gray (10YR 3/1) Ap material; moderate medium subangular blocky structure; slightly acid; abrupt smooth boundary.

Bg2—15 to 34 inches; gray (N 6/0) silt loam; many medium distinct yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to strong fine angular blocky; friable; few fine roots; many fine pores; few very fine dark gray (10YR 3/1) root channels; continuous gray (N 5/0) silt coats on prism faces; neutral; abrupt smooth boundary.

C1—34 to 54 inches; gray (10YR 6/1) silt loam; many medium distinct dark grayish brown (2.5Y 4/2) and yellowish brown (10YR 5/8) mottles; weak thin platy structure within varves; friable; many fine and few medium pores; thin discontinuous lenses of fine sand with stratified layers of silt and clay; neutral; gradual smooth boundary.

C2—54 to 60 inches; gray (10YR 6/1) silt loam; many medium distinct dark grayish brown (2.5Y 4/2) and yellowish brown (10YR 5/8) mottles; massive within varves; many very fine and fine pores; mildly alkaline.

The solum thickness ranges from 20 to 40 inches. The depth to free carbonates ranges from 18 to 60 inches. Most pedons do not have coarse fragments, but in some pedons they make up as much as 10 percent of the subhorizons.

The A horizon has hue of 5YR to 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is silt loam, very fine sandy loam, loam, or fine sandy loam. Structure is weak to strong, very fine to coarse, granular or subangular blocky. In some pedons there is an O horizon that ranges from a trace to as much as 6 inches thick over the A horizon. Reaction in the A horizon ranges from medium acid to mildly alkaline.

The Bg horizon has hue of 5YR to 2.5Y, value of 5 to 7, and chroma mainly of 0 to 2. More than 20 percent of the horizon is mottled with higher chroma. The Bg horizon is silt loam, very fine sandy loam, or silty clay loam. Structure is subangular or angular blocky within coarse or very coarse prisms. Consistence ranges from friable to very firm. Reaction ranges from slightly acid to mildly alkaline.

The C horizon has hue of 5YR to 5Y, value of 3 to 6, and chroma of 1 to 3. Within stratified layers it ranges from fine sand to silty clay. Reaction ranges from neutral to moderately alkaline.

Carlisle Series

The Carlisle series consists of very deep, very poorly drained soils formed in decomposed woody and herbaceous plant remains. Slopes range from 0 to 1 percent.

Carlisle soils and Palms soils formed in similar material, but the organic layers in Carlisle soils have a total thickness of more than 51 inches over mineral soil material.

Typical pedon of Carlisle muck, in a brushy area in the town of Kinderhook, 100 feet west of Rapp Road and 75 feet south of the Berkshire Spur of the Penn Central Railroad, at the intersection of the railroad and Rapp Road:

Oa1—0 to 13 inches; black (10YR 2/1) muck (sapric material); weak fine granular structure; very friable; 20 percent fiber, less than 5 percent rubbed; slightly acid; diffuse smooth boundary.

Oa2—13 to 19 inches; very dark gray (5YR 3/1) muck (sapric material); weak medium granular structure; very friable; 15 percent fiber, less than 5 percent rubbed; slightly acid; diffuse smooth boundary.

Oa3—19 to 80 inches; very dark gray (5YR 3/1) muck (sapric material); weak thick platy structure; very friable; 20 percent fiber, 5 percent rubbed; slightly acid.

The thickness of the organic deposits is more than 51 inches. The reaction throughout the profile ranges from very strongly acid to neutral. The content of fiber material ranges from 15 to 30 percent throughout.

The surface tier is black (10YR 2/1) and is dominantly sapric material. The structure is granular.

The subsurface tier has hue of 5YR to 10YR, value of 2 or 3, and chroma of 0 to 3. The layer is dominated by sapric material. The subsurface tier has granular or blocky structure or is massive.

The bottom tier has colors similar to those of the subsurface tier and has variable amounts of woody and herbaceous fiber, but the herbaceous fiber generally constitutes the greater proportion. This tier commonly is massive, but in some pedons it has weak, coarse, blocky or thick platy structure.

Castile Series

The Castile series consists of very deep, moderately well drained soils that formed in glacial outwash. These soils are on outwash terraces and outwash plains. Slopes range from 0 to 3 percent.

Castile soils are in a drainage sequence with somewhat excessively drained Hoosic soils, somewhat poorly drained and poorly drained Fredon soils, and very poorly drained Halsey soils. Castile soils are near well drained Blasdell soils.

Typical pedon of Castile gravelly silt loam, in the town of Chatham, 0.1 mile west of intersection of White Mills and Merwin Roads, 300 feet south of Merwin Road, in a pasture:

Ap—0 to 8 inches; brown (10YR 4/3) gravelly silt loam; weak fine granular structure; friable; many fine roots; 15 percent rock fragments; strongly acid; clear smooth boundary.

Bw1—8 to 16 inches; yellowish brown (10YR 5/4) gravelly loam; weak medium subangular blocky structure; friable; few fine roots; 25 percent rock fragments; strongly acid; clear smooth boundary.

Bw2—16 to 24 inches; light olive brown (2.5Y 5/4) very gravelly sandy loam; many fine distinct grayish brown (10YR 5/2) mottles and many fine prominent yellowish brown (10YR 5/8) mottles; weak fine granular structure; very friable; 45 percent rock fragments; strongly acid; clear smooth boundary.

C1—24 to 48 inches; grayish brown (2.5Y 5/2) very gravelly loamy sand; many coarse prominent brownish yellow (10YR 6/8) stains and brown (7.5YR 4/4) mottles; single grain; loose; 35 percent rock fragments; strongly acid; clear wavy boundary.

C2—48 to 72 inches; grayish brown (2.5Y 5/2) layers of sand and fine gravel; many coarse prominent brownish yellow (10YR 6/8) stains and reddish yellow (5YR 6/6) mottles; single grain; loose; 40 percent rock fragments; strongly acid.

The solum thickness ranges from 24 to 40 inches. The content of rock fragments ranges from 15 to 30 percent in the A horizon, 20 to 60 percent in the B horizon, and 35 to 70 percent in the C horizon. Unless limed, the soil ranges from very strongly acid to medium acid in the solum and strongly acid to neutral in the C horizon. The depth to carbonates ranges from 5 to 10 feet.

The Ap horizon has hue of 10YR or 2.5Y, value of 3

to 5, and chroma of 2 or 3. It ranges from sandy loam to silt loam in the fine earth fraction. It has weak or moderate, granular structure.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is sandy loam to silt loam in the fine earth fraction. It has weak, granular or subangular blocky structure.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. It ranges from loamy sand to loam in the fine earth fraction or is stratified sand and gravel.

Cazenovia Series

The Cazenovia series consists of very deep, well drained and moderately well drained soils on glacial till uplands. They formed in moderately fine textured, calcareous glacial till derived from red shale. Slopes range from 3 to 25 percent.

Cazenovia soils are in a drainage sequence with somewhat poorly drained Ovid soils. Cazenovia soils and Bernardston soils are similar and are in similar landscape settings. Cazenovia soils are redder than Bernardston soils and have a finer textured subsoil and substratum.

Typical pedon of Cazenovia silt loam, 3 to 8 percent slopes, in the town of New Lebanon, 1,250 feet north of Hoddack Hill Road and 0.6 mile southwest of its intersection with County Route 9:

Ap—0 to 10 inches; dark brown (7.5YR 4/2) silt loam; weak medium subangular blocky structure; friable; nonsticky, nonplastic; few fine and large roots; 2 percent rock fragments; neutral; abrupt smooth boundary.

B/E—10 to 15 inches; reddish brown (5YR 5/3) silty clay loam (B part); moderate coarse subangular blocky structure; friable; sticky, plastic; pink (5YR 7/3) silt and very fine sand along vertical faces of peds (E part); few fine roots; many fine pores; 2 percent rock fragments; moderately acid; clear wavy boundary.

Bt—15 to 34 inches; dark brown (7.5YR 4/4) silty clay loam; weak coarse prisms parting to moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; many fine and very fine vesicular pores with occasional clay linings; continuous reddish brown (5YR 5/3) clay films on faces of peds; 8 percent rock fragments; moderately acid; clear smooth boundary.

C1—34 to 44 inches; dark reddish gray (5YR 4/2) silty clay loam; massive; firm; sticky, plastic; few fine pores; 10 percent rock fragments; neutral; gradual wavy boundary.

C2—44 to 60 inches; dark reddish gray (5YR 4/2) silty clay loam; massive; firm; sticky, plastic; 10 percent rock fragments; mildly alkaline; slightly effervescent.

The thickness of the solum ranges from 20 to 45 inches. The content of rock fragments ranges from 2 to 25 percent in the solum and from 10 to 40 percent in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3. It is fine sandy loam, very fine sandy loam, silt loam, or loam. It ranges from moderately acid to neutral.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 3 or 4, and some pedons have faint mottles. The horizon is clay loam or silty clay loam. Reaction ranges from moderately acid to neutral in the upper part, and pH increases with depth.

The C horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 2 to 4. It is loam to silty clay loam. It is massive or has platy structure. It is firm or very firm and ranges from neutral to moderately alkaline. Mottles are in the C horizon of some pedons.

Collamer Series

The Collamer series consists of very deep, moderately well drained soils formed in glacial lake sediments dominated by silt and very fine sand. Collamer soils are on dissected lake plains. Slopes range from 0 to 15 percent.

Collamer soils are in a drainage sequence with somewhat poorly drained Niagara soils and poorly drained and very poorly drained Canandaigua soils. Collamer soils and Hudson and Scio soils formed in similar sediments, but Collamer soils are not as clayey as Hudson soils and are more clayey than Scio soils.

Typical pedon of Collamer silt loam, 0 to 3 percent slopes, town of Livingston, 200 feet west of Walkers Mills Road, 1,320 feet north of its intersection with Wire Road:

Ap—0 to 11 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; many fine and medium roots; moderately acid; abrupt smooth boundary.

E1—11 to 13 inches; pale brown (10YR 6/3) silt loam; moderate thin platy structure; very friable; few fine faint yellowish brown (10YR 5/4) mottles; many fine roots; few fine vesicular and tubular pores; moderately acid; clear smooth boundary.

E2—13 to 17 inches; light yellowish brown (2.5Y 6/4) silt loam; moderate fine subangular blocky structure; friable; common fine prominent yellowish brown (10YR 5/8) mottles and few fine faint olive yellow (2.5Y 6/6) mottles; common fine roots; common fine pores; moderately acid; clear smooth boundary.

B/E—17 to 25 inches; yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) silt loam (B part); light brownish gray (10YR 6/2) stripped sand grains 1 to 3 millimeters thick on faces of peds (E part); common fine distinct strong brown (7.5YR 5/6) mottles and common fine faint yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to moderate medium and coarse angular blocky; grayish brown (10YR 5/2) and brown (10YR 5/3) prism faces; friable; slightly brittle; common fine roots concentrated along vertical prism faces; common fine vesicular and tubular pores; moderately acid; gradual wavy boundary.

Bt—25 to 47 inches; yellowish brown (10YR 5/4) silt loam; many medium prominent grayish brown (2.5Y 5/2) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; grayish brown (10YR 5/2) silt coats on faces of prisms; thin discontinuous gray (5Y 5/1) clay films in pores and on faces of peds; common medium dark brown (7.5YR 4/2) manganese stains; friable; few fine roots in the upper part along faces of peds; common fine and very fine tubular pores; moderately acid; clear smooth boundary.

C—47 to 80 inches; light olive brown (2.5Y 5/4), yellowish brown (10YR 5/4), and gray (5YR 6/1) varves of very fine sandy loam, silt loam, and silty clay loam; common fine and medium distinct dark yellowish brown (10YR 4/6) mottles; firm; neutral; slightly effervescent at 72 inches.

The thickness of the solum ranges from 24 to 48 inches. The depth to carbonates ranges from 20 to 72 inches. The content of rock fragments ranges from 0 to 5 percent throughout. Reaction is strongly acid to neutral in the A, E, and B/E horizons, moderately acid to mildly alkaline in the Bt horizon, and slightly acid to moderately alkaline in the C horizon.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3. It is fine sandy loam, very fine sandy loam, or silt loam.

The E horizon has hue of 2.5Y to 7.5YR, value of 5 or 6, and chroma of 2 to 4. It is silt loam, loam, or fine sandy loam.

The Bt horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4 above 30 inches and 2 to 4 below 30 inches. It is mottled. It is silt loam or silty clay loam.

The C horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is silty clay loam or stratified silt and very fine sand.

Elmridge Series

The Elmridge series consists of very deep, moderately well drained soils formed in glacial lake sediments. Elmridge soils are on lake plains. Slopes range from 0 to 8 percent.

Elmridge soils are in a drainage sequence with somewhat poorly drained Shaker soils and are near sandy Knickerbocker soils and clayey Hudson and Rhinebeck soils.

Typical pedon of Elmridge very fine sandy loam, 3 to 8 percent slopes, in the town of Stuyvesant, 20 feet south of Lang Road, 0.2 mile west of Sharptown Road:

Ap—0 to 10 inches; dark brown (10YR 4/3) very fine sandy loam; weak fine granular structure; friable; moderately acid; abrupt smooth boundary.

Bw1—10 to 17 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; few fine and very fine tubular pores; slightly acid; diffuse wavy boundary.

Bw2—17 to 23 inches; yellowish brown (10YR 5/4) fine sandy loam; few medium light brownish gray (2.5Y 6/2) mottles; weak angular blocky structure; friable; few fine roots; many fine and very fine tubular pores; slightly acid; diffuse wavy boundary.

2C1—23 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; few medium distinct brown (10YR 5/3 and 7.5YR 5/2) mottles; weak thin platy structure within stratified layers of silt and clay; firm; slightly acid; gradual wavy boundary.

2C2—60 to 80 inches; brown (10YR 5/3) silt and brown (7.5YR 5/2) clay stratified with lenses of very fine sand; massive; firm; mildly alkaline.

The thickness of the solum and the depth to the underlying clayey material range from 18 to 40 inches. The content of rock fragments ranges from 0 to 5 percent in the solum and from 0 to 2 percent in the 2C horizon. The soil ranges from very strongly acid to slightly acid in the solum and from moderately acid to mildly alkaline in the 2C horizon.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3. It is fine sandy loam, sandy

loam, loam, or very fine sandy loam. The A horizon has weak or moderate, fine or medium granular structure.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. It is fine sandy loam, sandy loam, or loam. The lower part of the B horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 6. Chroma of 2 is limited to horizons below a depth of 30 inches. The B horizon is fine sandy loam, sandy loam, silty clay loam, or silty clay.

The 2C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It mainly is silty clay loam, silty clay, or clay. It is massive. Some pedons have thin films of silt or very fine sand on ped faces. Consistency is firm or very firm.

Elnora Series

The Elnora series consists of very deep, moderately well drained soils formed in sandy sediments deposited by water. Elnora soils are on glacial lake plains. Slopes range from 0 to 3 percent.

Elnora soils are in a drainage sequence with somewhat excessively drained Knickerbocker soils and poorly and somewhat poorly drained Walpole soils.

Typical pedon of Elnora fine sandy loam, in the town of Stuyvesant, 150 feet west of Sunnyside Road, 500 feet north of the entrance of Sunnyside Farms:

Ap—0 to 10 inches; dark brown (10YR 3/3) fine sandy loam; weak medium subangular blocky structure; very friable; many fine and common medium roots; strongly acid; abrupt smooth boundary.

Bw—10 to 21 inches; yellowish brown (10YR 5/4) loamy fine sand; common medium faint dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; very friable; few fine roots; common fine and medium pores; strongly acid; clear wavy boundary.

C1—21 to 28 inches; grayish brown (10YR 5/2) loamy fine sand; common medium faint dark yellowish brown (10YR 4/4) mottles; massive; friable; few fine roots; common fine and medium pores; strongly acid; gradual wavy boundary.

C2—28 to 60 inches; grayish brown (10YR 5/2) and dark yellowish brown (10YR 4/4) fine sand; single grain; loose; strongly acid.

The solum thickness ranges from 6 to 40 inches. There commonly are no rock fragments, but some pedons may have thin subhorizons that are up to 15 percent gravel. Reaction ranges from very strongly acid to slightly acid in the solum and from strongly acid to neutral in the C horizon.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. It ranges from loamy fine sand to very fine sandy loam.

The B horizon has hue of 5YR to 5Y, value of 4 to 6, and chroma of 3 to 6. It is loamy fine sand or fine sand. Structure is weak subangular blocky or platy, and consistency is very friable or friable. Some pedons do not have a B horizon.

The C horizon has hue of 5YR to 5Y, value of 3 to 5, and chroma of 1 to 4. It is loamy fine sand or fine sand. The material is massive or single grain. Consistence is loose to friable.

Farmington Series

The Farmington series consists of shallow, well drained to somewhat excessively drained soils formed in glacial till derived from dolomitic limestone. The soils are on long, narrow crests and ridges. Slopes range from 1 to 35 percent.

Farmington soils are similar to Nassau soils, but Nassau soils are underlain by folded shale bedrock. Farmington soils commonly are adjacent to very deep, well drained Stockbridge soils.

Typical pedon of Farmington silt loam, in an area of Farmington silt loam, rolling, very rocky, in the town of Copake, 40 feet east of Snyder Pond Road and 20 feet south of its intersection with Sky Farm Road:

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many fine roots; 10 percent rock fragments; neutral (limed); abrupt smooth boundary.

Bw—8 to 16 inches; brown (7.5YR 5/4) silt loam; weak medium subangular blocky structure parting to weak fine granular; very friable; common fine roots; 10 percent rock fragments; slightly acid; abrupt wavy boundary.

R—16 inches; hard gray limestone bedrock.

The solum thickness and the depth to bedrock range from 10 to 20 inches. The content of rock fragments ranges from 5 to 35 percent in the solum.

Unless limed, the soil ranges from strongly acid to slightly acid in the A horizon and moderately acid to mildly alkaline in the B horizon. There are no free carbonates in the fine earth fraction above bedrock.

The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It is fine sandy loam, loam, or silt loam in the fine earth fraction.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 6. It is fine sandy loam, loam, or silt loam in the fine earth fraction. It has weak, fine or

medium, subangular blocky or weak, fine, granular structure. The B horizon is very friable or friable.

Fluvaquents

Fluvaquents consist of very deep, somewhat poorly drained to very poorly drained soils formed in material recently deposited by streams and rivers. Fluvaquents are on the most commonly flooded areas of flood plains along major and secondary streams. Slopes range from 0 to 3 percent.

Fluvaquents are mapped with better drained Udifluvents. They are commonly near Occum, Linlithgo, and Limerick soils.

Fluvaquents are in that part of the flood plain where intermittent scourings and redeposition of sediments cause the composition and properties of the soil to differ from place to place. Because of the wide range of texture and other characteristics, a typical pedon of Fluvaquents is not provided.

Generally the surface layer of these soils is 2 to 12 inches thick. The depth to bedrock is more than 60 inches. The content of rock fragments, mainly gravel, channers, and cobblestones, ranges from 0 to 50 percent. Fluvaquents are strongly acid to mildly alkaline.

The surface layer has hue of 10YR to 5Y, value of 1 or 2, and chroma of 0 or 1. It is sandy loam, loam, or silt loam and the gravelly or very gravelly analogs of those textures.

The substratum has hue of 10YR to 5Y, value of 3 to 6, and chroma of 0 to 1. Mottles are common. The substratum mainly is sandy loam, silt loam, loam, or silty clay loam and the gravelly or very gravelly analogs of those textures. Some pedons have thin strata of sand or loamy sand.

Fredon Series

The Fredon series consists of very deep, poorly drained to somewhat poorly drained soils on outwash plains. The soils formed in glaciofluvial sand and gravel deposits derived from limestone, sandstone, and shale. Slopes range from 0 to 3 percent.

Fredon soils are in a drainage sequence with somewhat excessively drained Hoosic soils, well drained Blasdell soils, moderately well drained Castile soils, and very poorly drained Halsey soils. Fredon soils have mottles in the B horizon, and Hoosic and Blasdell soils do not. Fredon soils are grayer than Castile soils but are not as gray nor as mottled as Halsey soils. Fredon soils are similar to Walpole soils but are not as sandy.

Typical pedon of Fredon silt loam, in the town of Ancram, 300 feet west of N.Y. Route 22 and 900 feet north of the Dutchess County line:

Ap—0 to 7 inches; very dark grayish brown (2.5Y 3/2) silt loam, grayish brown (2.5Y 5/2) dry; weak fine granular structure; common fine distinct dark reddish brown (5YR 3/2) mottles; friable; 8 percent rock fragments; many fine roots; neutral; abrupt smooth boundary.

Bg1—7 to 20 inches; dark grayish brown (2.5Y 4/2) gravelly fine sandy loam; weak medium subangular blocky structure; few fine distinct light olive brown (2.5Y 5/6) and dark reddish brown (5YR 3/2) mottles; many medium distinct dark yellowish brown (10YR 4/6) mottles; friable; slightly firm in places; 15 percent rock fragments; common fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Bg2—20 to 32 inches; dark grayish brown (2.5Y 4/2) gravelly fine sandy loam; weak medium subangular blocky structure; few fine prominent reddish brown (5YR 5/3) mottles and few fine distinct olive (5Y 4/4) and dark yellowish brown (10YR 4/6) mottles; very friable; firm in place; ½-inch-thick band of dark grayish brown (2.5Y 4/2) very fine sandy loam and ¼-inch-thick band of dark grayish brown (2.5Y 4/2) very gravelly loamy sand; 25 percent rock fragments; few fine roots; common fine vesicular pores and few very fine tubular pores; neutral; clear wavy boundary.

2Cg1—32 to 40 inches; dark grayish brown (2.5Y 4/2) very gravelly loamy fine sand; single grain; loose; few roots; 35 percent rock fragments; neutral; very slightly effervescent; clear wavy boundary.

2Cg2—40 to 60 inches; dark grayish brown (2.5Y 4/2) very gravelly loamy sand; single grain; loose; 45 percent rock fragments; few roots; neutral; very slightly effervescent.

The solum thickness ranges from 22 to 40 inches. The depth to bedrock is more than 6 feet. The content of rock fragments ranges from 2 to 35 percent in the A and Bw horizons and from 10 to 60 percent in the C horizon. Unless limed, the soil is medium acid to neutral in the solum and slightly acid to moderately alkaline in the C horizon.

The Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. It is loam, fine sandy loam, very fine sandy loam, or silt loam.

The Bg horizon has hue of 7.5YR to 5Y, value of 4 to 6, chroma of 1 to 4 and is mottled. It is loam, fine sandy

loam, very fine sandy loam, or silt loam in the fine earth fraction. The Bg horizon has weak or moderate, subangular blocky structure, weak, coarse, prismatic structure, or platy structure. It ranges from very friable to firm in subhorizons.

The C horizon has hue of 5YR to 5Y, value of 4 to 6, and chroma of 0 to 4. It is sand to loamy fine sand in the fine earth fraction and mainly is stratified. Carbonates are common.

Georgia Series

The Georgia series consists of very deep, moderately well drained soils formed in loamy glacial till. The soils are on till plains and glaciated uplands. Slopes range from 0 to 15 percent.

Georgia soils are in a drainage sequence with well drained Stockbridge soils, somewhat poorly drained and poorly drained Massena soils, and poorly drained and very poorly drained Sun soils. Stockbridge soils are not mottled and are on slightly higher positions in the landscape. Massena and Sun soils are grayer and more mottled and are in shallow depressions and drainageways. Georgia soils and Pittstown soils formed in similar material, but Pittstown soils have a dense substratum.

Typical pedon of Georgia silt loam, 3 to 8 percent slopes, in the town of New Lebanon, 150 feet west of U.S. Route 20 and 0.2 mile south of N.Y. Route 22:

Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam; moderate fine granular structure; friable; many fine roots; 2 percent coarse fragments; slightly acid; abrupt smooth boundary.

Bw1—9 to 20 inches; dark yellowish brown (10YR 4/4) channery silt loam; moderate medium subangular blocky structure; friable; few fine roots; few very fine tubular pores; 15 percent shale and phyllite fragments; slightly acid; clear wavy boundary.

Bw2—20 to 32 inches; light olive brown (2.5Y 5/4) channery silt loam; few fine faint yellowish brown (10YR 5/4) mottles and few fine distinct dark grayish brown (10YR 4/2) mottles; moderate medium subangular blocky structure; friable; 15 percent shale and phyllite fragments; common fine and very fine tubular and vesicular pores; slightly acid; clear wavy boundary.

C1—32 to 53 inches; olive (5Y 5/3) channery loam; massive; friable; common fine distinct yellowish brown (10YR 5/6) mottles; 15 percent shale and phyllite fragments; many very fine tubular pores; neutral; gradual wavy boundary.

C2—53 to 60 inches; olive (5Y 5/3) channery loam; massive; friable; common fine distinct yellowish brown (10YR 5/6) mottles; 15 percent rock fragments; many fine tubular pores; mildly alkaline; slightly effervescent.

The solum is 16 to 32 inches thick. The depth to bedrock is more than 6 feet. The content of rock fragments ranges from 0 to 55 percent throughout the soil. Reaction ranges from strongly acid to neutral in the solum and is less acid with depth.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 or 3. It is silt loam or loam and their gravelly or very gravelly analogs.

The Bw horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is silt loam or loam and their gravelly or very gravelly analogs. Few to many low-chroma mottles are above a depth of 24 inches.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 4. It is fine sandy loam, loam, or silt loam and their gravelly or very gravelly analogs.

Halsey Series

The Halsey series consists of very deep, very poorly drained soils on outwash plains and terraces. The soils formed in water-sorted gravelly outwash. Slopes range from 0 to 3 percent.

Halsey soils are in a drainage sequence with somewhat excessively drained Hoosic soils, well drained Blasdell soils, moderately well drained Castile soils, and somewhat poorly to poorly drained Fredon soils. Halsey soils differ from Hoosic, Blasdell, Castile, and Fredon soils by being grayer in the subsoil and substratum and having a thin, dark surface layer.

Typical pedon of Halsey mucky silt loam, in the town of Kinderhook, 0.2 mile north of the intersection of Route 28A and Niverville Road, 100 feet east of Niverville Road:

Ap—0 to 6 inches; dark yellowish brown (10YR 3/4) mucky silt loam; weak fine granular structure; slightly sticky; many large, medium, and fine roots; slightly acid; abrupt smooth boundary.

Bg1—6 to 12 inches; gray (N 6/0) loam; many coarse prominent yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; slightly sticky; slightly acid; clear smooth boundary.

Bg2—12 to 23 inches; gray (5Y 6/1) loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; slightly sticky; 1 percent rock fragments; neutral; abrupt smooth boundary.

2C—23 to 60 inches; light olive gray (5Y 6/2) stratified sand and gravel; few coarse distinct light olive brown (2.5Y 5/4) mottles; loose; single grain; 60 percent rock fragments; neutral.

The solum ranges from 20 to 40 inches in thickness. The content of rock fragments ranges from 0 to 30 percent in the solum and from 10 to 60 percent in the C horizon. The soil is moderately acid to neutral in the solum and slightly acid to moderately alkaline in the C horizon. The depth to carbonates is at least 30 inches.

The Ap horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is fine sandy loam, very fine sandy loam, or silt loam, and their mucky analogs. It has granular or subangular blocky structure.

The B horizon has hue of 10YR to 5Y and 5BG, value of 4 to 6, and chroma of 0 to 2 and is mottled. It is fine sandy loam, very fine sandy loam, loam, or silt loam. The B horizon has subangular blocky or platy structure and is friable or firm.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma mainly of 0 to 2. Chroma of 0 to 4 is at a depth of more than 30 inches. The C horizon is sand to loamy fine sand above a depth of 40 inches and sand to fine sandy loam below 40 inches and mainly is stratified.

Hoosic Series

The Hoosic series consists of very deep, somewhat excessively drained soils formed in water-sorted outwash material. The nearly level and gently sloping areas are on outwash plains. The complex and more sloping areas are on kames, terraces, and eskers. Slopes range from 0 to 35 percent.

Hoosic soils in many places are near Knickerbocker and Blasdell soils. Hoosic soils are skeletal in the subsoil, and Knickerbocker soils are sandy throughout. Hoosic soils have mixed mineralogy within the rock-fragment component, but Blasdell soils are mostly shale in the rock-fragment component. Hoosic soils are in a drainage sequence with moderately well drained Castile soils, somewhat poorly drained and poorly drained Fredon soils, and very poorly drained Halsey soils. Hoosic soils do not have mottles; all the other soils in the drainage sequence are mottled.

Typical pedon of Hoosic gravelly sandy loam, 0 to 3 percent slopes, in a gravel pit in the town of Kinderhook, 75 feet east-northeast of Ichabod Crane Central School, 135 yards south of State Farm Road:

Ap—0 to 8 inches; dark brown (10YR 4/3) gravelly sandy loam; weak fine granular structure; very friable; many fine roots; 20 percent rock fragments; strongly acid; abrupt smooth boundary.

Bw—8 to 15 inches; yellowish brown (10YR 5/6) very gravelly sandy loam; very weak fine granular structure; very friable; common fine roots; 40 percent rock fragments; strongly acid; clear wavy boundary.

2C1—15 to 19 inches; yellowish brown (10YR 5/4) very gravelly loamy sand; single grain; loose; common fine roots; 40 percent rock fragments; strongly acid; gradual wavy boundary.

2C2—19 to 37 inches; dark yellowish brown (10YR 4/4) very gravelly loamy sand; stratified sand and gravel; single grain; loose; common fine roots; 40 percent rock fragments; strongly acid; clear wavy boundary.

2C3—37 to 60 inches; dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2) very gravelly sand; stratified sand and gravel; single grain; loose; few fine roots; 35 percent coarse fragments; strongly acid.

The thickness of the solum ranges from 14 to 36 inches. The content of rock fragments ranges from 10 to 50 percent in the solum and 35 to 70 percent in the 2C horizon. Unless limed, the soil is very strongly acid or strongly acid in the solum and is very strongly acid to moderately acid in the substratum.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 or 3. It ranges from sandy loam to silt loam in the fine earth fraction. It has weak or moderate, medium or fine, granular structure. It is friable or very friable.

The B horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 4 or 6. In the fine earth fraction it ranges from sandy loam to loam above a depth of 10 inches and is loamy sand or sand below that depth. The B horizon has weak or very weak, fine or medium, granular or subangular blocky structure and is friable or very friable.

The 2C horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4. It is loamy sand or sand in the fine earth fraction.

Hudson Series

The Hudson series consists of very deep, moderately well drained soils formed in fine textured lacustrine deposits. The soils are on dissected lowlands adjacent to the Hudson River. Slopes range from 0 to 35 percent.

Hudson soils are a part of an undifferentiated group with very fine textured, moderately well drained

Vergennes soils. Hudson soils are in a drainage sequence with somewhat poorly drained Rhinebeck and Kingsbury soils and very poorly drained Madalin soils. Hudson soils are not as mottled or as gray as the other soils in the sequence. Hudson and Collamer soils formed in similar materials, but Hudson soils have more clay.

Typical pedon of Hudson silt loam, in an area of Hudson and Vergennes soils, 3 to 8 percent slopes, in the town of Stuyvesant, 1,000 feet north of Allendale Road, 0.5 mile east of its intersection with Sharptown Road:

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many fine and medium roots; moderately acid; abrupt smooth boundary.

E—6 to 10 inches; brown (10YR 5/3) silt loam; common fine faint brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; friable; many fine and few medium roots; common very fine vesicular pores; common very fine tubular pores; some stripped sand grains on ped faces; strongly acid; gradual wavy boundary.

B/E—10 to 15 inches; dark brown (10YR 4/3) silty clay loam (B part); light gray (10YR 7/2) ped faces (E part); common fine faint yellowish brown (10YR 5/4) mottles; strong fine and medium subangular blocky structure; firm; some stripped sand grains on ped faces; common fine and occasional medium roots; common fine vesicular and few fine tubular pores; few patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt—15 to 26 inches; dark brown (10YR 4/3) silty clay loam; common medium distinct reddish brown (5YR 5/4) mottles and few medium distinct light brownish gray (10YR 6/2) mottles; strong medium and coarse blocky structure; firm; sticky, plastic; thin clay films on ped exteriors and in pores; common fine and very fine pores; strongly acid; clear wavy boundary.

C1—26 to 45 inches; dark brown (7.5YR 4/4 and 10YR 4/3) and gray (10YR 6/1) varved layers of silty clay loam; few black (10YR 2/1) flecks or stains; medium thick and very thick platy structure from varves; firm; sticky, plastic; strongly acid; abrupt smooth boundary.

C2—45 to 60 inches; dark brown (7.5YR 4/4 and 10YR 4/3) and gray (10YR 6/1) varved silty clay; few black (10YR 2/1) stains; medium thick and very thick platy structure from varves; firm; sticky, plastic; mildly alkaline; weakly effervescent in upper part, moderately effervescent with depth.

The thickness of the solum ranges from 20 to 60 inches. There generally are no rock fragments. Reaction ranges from strongly acid to neutral in the surface and subsurface layers and the subsoil, and from strongly acid to moderately alkaline in the substratum. Carbonates are at a depth of 20 to 70 inches.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 2 or 3. It is silt loam.

The E horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 2 or 3. It is silt loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 4. It has some bright mottles. It is clay loam or silty clay.

The C horizon has hue of 5YR to 2.5Y, value of 3 to 6, and chroma of 1 to 4. It ranges mainly from silt to clay in thin layers and has a few layers of very fine sand.

Kingsbury Series

The Kingsbury series consists of very deep, somewhat poorly drained, very slowly permeable soils on dissected lake plains. The soils formed in clayey, nonacid lacustrine sediments. Slopes range from 0 to 8 percent.

Kingsbury soils are in an undifferentiated group with less clayey Rhinebeck soils. Kingsbury soils are in a drainage sequence with and commonly are adjacent to moderately well drained Hudson and Vergennes soils and very poorly drained Madalin soils. Hudson and Vergennes soils are not as gray as Kingsbury soils. Madalin soils are darker and grayer than Kingsbury soils.

Typical pedon of Kingsbury silty clay loam, in an area of Kingsbury and Rhinebeck soils, 0 to 3 percent slopes, in the town of Stuyvesant, 0.5 mile west of the intersection of Hollow Road and Eickybush Road, 0.3 mile south of Hollow Road and 90 feet east of the powerlines:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silty clay loam, light brownish gray (2.5Y 6/2) dry; moderate medium granular structure; friable; many fine roots; few pores; moderately acid; clear smooth boundary.

E—9 to 11 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium prominent strong brown (7.5YR 5/8) mottles and common fine faint gray (5Y 5/1) mottles; moderate fine and medium subangular blocky structure; friable; sticky, plastic; common fine roots; common fine pores; grayish brown (2.5Y 5/2)

stripped sand grains on faces of peds; strongly acid; clear wavy boundary.

Bt—11 to 29 inches; dark brown (10YR 4/3) clay; many medium distinct strong brown (7.5YR 5/6) and dark brown (7.5YR 4/4) mottles; moderate medium and coarse subangular blocky structure parting to moderate fine angular blocky; firm; very sticky, plastic; few roots; common fine pores with clay linings; dark gray (10YR 4/1) clay films on faces of peds; moderately acid; gradual wavy boundary.

C—29 to 60 inches; grayish brown (2.5Y 5/2) clay and dark grayish brown (10YR 4/2) silt; many medium distinct gray (5Y 6/1) and dark brown (7.5YR 4/4) mottles; massive parting to aggregates which resemble very fine angular blocky structure; firm; very sticky, very plastic; few discontinuous vertical streaks of light gray (10YR 6/1) lime; moderately alkaline; strongly effervescent.

The solum thickness ranges from 20 to 36 inches. The depth to carbonates ranges from 20 to 36 inches. The depth to bedrock is more than 60 inches. The content of coarse fragments ranges from 0 to 3 percent. These soils range from strongly acid to mildly alkaline in the solum and are moderately alkaline in the substratum.

The A or Ap horizon has hue of 10YR to 5Y, value of 2 to 5, and chroma of 1 to 3. It is silt loam or very fine sandy loam to silty clay. It has granular or subangular blocky structure and is very friable to firm.

The E horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 to 4 and is mottled. It ranges from silt loam or very fine sandy loam to silty clay. It has angular or subangular blocky to platy structure and is friable or firm.

The B horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 4. It is clay.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 4. It is massive within varved layers of clay and silt.

Knickerbocker Series

The Knickerbocker series consists of very deep, somewhat excessively drained soils that formed in deposits of sandy outwash. The soils are on outwash plains throughout the western portion of the county. Slopes range from 0 to 30 percent.

Knickerbocker soils are in a drainage sequence with moderately well drained Elnora soils and somewhat poorly and poorly drained Walpole soils. Knickerbocker soils are not mottled above a depth of 40 inches; Elnora and Walpole soils are mottled. Knickerbocker soils commonly are near Hoosic or Blasdell soils but do not have as much gravel as those soils.

Typical pedon of Knickerbocker fine sandy loam, 0 to 3 percent slopes, in the town of Stuyvesant, 1,100 feet east of the south intersection of Sunnyside Road and U.S. Route 9, 144 feet south of Sunnyside Road, 441 feet west of the powerline:

Ap—0 to 12 inches; dark brown (10YR 3/3) fine sandy loam, pale brown (10YR 6/3) dry; moderate fine granular structure; moderately acid; abrupt smooth boundary.

Bw1—12 to 20 inches; dark yellowish brown (10YR 4/4) fine sandy loam; very weak medium subangular blocky structure parting to weak fine granular; very friable; common fine and medium roots; common medium pores; 10 percent rock fragments; strongly acid; abrupt wavy boundary.

Bw2—20 to 35 inches; dark yellowish brown (10YR 4/4) loamy fine sand; very weak coarse subangular blocky structure; very friable; 10 percent rock fragments; moderately acid; abrupt wavy boundary.

C1—35 to 53 inches; olive brown (2.5Y 4/4) loamy fine sand; common medium dark brown (10YR 3/3) stains; massive; very friable; many medium and fine pores; 5 percent rock fragments; few pockets of very dark grayish brown (10YR 3/2) sand; moderately acid; abrupt wavy boundary.

C2—53 to 60 inches; dark grayish brown (2.5Y 4/2) fine sand; common medium and large distinct dark reddish brown (5YR 3/4) and dark brown (7.5YR 4/4) stains; single grain; loose; few nodular iron concretions; strongly acid.

The thickness of the solum ranges from 25 to 44 inches. The content of rock fragments, mainly gravel, ranges from 0 to 15 percent in the solum and substratum. Unless limed, the soil ranges from very strongly acid to moderately acid.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is fine sandy loam or sandy loam. It has weak or moderate, fine or medium granular structure. Consistence is friable or very friable.

The B horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 to 6. It is fine sandy loam or sandy loam above a depth of 20 inches and loamy fine sand or loamy sand below that. The dominant sand size is fine sand. Structure is weak or very weak, subangular blocky or granular. Consistence is friable or very friable.

The C horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4. It ranges in texture from

loamy fine sand to sand. Some pedons have high-chroma mottles below a depth of 40 inches.

Lanesboro Series

The Lanesboro series consists of very deep, well drained, moderately permeable to slowly permeable soils on glacial uplands at an elevation of more than 1,000 feet. The soils formed in acid glacial till. Slopes range from 3 to 45 percent.

Lanesboro soils are mapped with poorly drained Monarda soils in areas where slopes range from 3 to 15 percent and are near Monarda soils where slopes are more than 15 percent. Lanesboro soils and Bernardston soils formed in similar material, but Lanesboro soils are at a higher elevation and are in a frigid temperature regime.

Typical pedon of Lanesboro channery silt loam, in an area of Lanesboro-Monarda association, strongly sloping, very stony, in the town of Hillsdale, 20 feet west of Spring Brook Road, 1 mile east of its intersection with Overlook Road:

Ap—0 to 4 inches; dark brown (10YR 3/3) channery silt loam; weak fine and medium granular structure; friable; 15 percent rock fragments; many fine and few medium roots; strongly acid; clear smooth boundary.

Bw1—4 to 17 inches; dark yellowish brown (10YR 4/4) channery silt loam; few fine faint yellowish brown (10YR 5/6) mottles in the lower part; weak fine and medium subangular blocky structure; friable; 16 percent rock fragments; many fine and few medium roots; common fine vesicular pores and few fine tubular pores; very strongly acid; clear irregular boundary.

Bw2—17 to 41 inches; dark grayish brown (2.5Y 4/2) channery silt loam; very weak coarse prismatic structure parting to strong medium platy; firm; olive (5Y 5/3) vertical streaks along faces of prisms; yellowish brown (10YR 5/8) rind around prisms; thin patchy clay films on faces of peds; 26 percent rock fragments; common medium vesicular pores and few very fine tubular pores; strongly acid; clear smooth boundary.

Cd1—41 to 47 inches; dark grayish brown (2.5Y 4/2) and light brownish gray (2.5Y 6/2) channery loam; weak coarse and medium platy structure; firm; 30 percent rock fragments; few fine tubular pores; strongly acid; clear smooth boundary.

Cd2—47 to 60 inches; grayish brown (2.5Y 5/2) channery loam; massive; firm; dark reddish brown (5YR 3/3) stains; 18 percent rock fragments; strongly acid.

The solum is 15 to 42 inches thick. The content of rock fragments is 5 to 25 percent in the A horizon and from 5 to 35 percent in the B and C horizons. Reaction is very strongly acid to moderately acid throughout. The texture is loam or silt loam or their channery analogs.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 to 3. Some pedons have an E horizon.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 6 in the upper part and hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6 in the lower part. It is friable or very friable.

The Cr horizon has hue of 2.5Y or 5Y, value of 3 to 5, and chroma of 2 or 3. It has platy structure or is massive. Consistence is firm and brittle.

Limerick Series

The Limerick series consists of very deep, poorly drained soils formed in recent alluvium. The soils are on flood plains. Slopes range from 0 to 3 percent.

Limerick soils are in a drainage sequence with well drained Occum soils and somewhat poorly drained Linlithgo soils. Limerick soils are grayer and have more mottles closer to the surface than Occum or Linlithgo soils. Limerick soils are near well drained to very poorly drained, frequently flooded Fluvaquents and Udifluvents.

Typical pedon of Limerick silt loam, in the town of Greenport, 100 feet north of Fingar Road, 1,300 feet east of its intersection with Hiscox Road and Newman Road:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, brown (10YR 5/3) crushed; moderate very fine granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

Bg—6 to 21 inches; dark gray (10YR 4/1) silt loam, dark grayish brown (10YR 4/2) crushed; few fine faint strong brown (7.5YR 5/8) and red (2.5YR 4/6) mottles; weak medium subangular blocky structure; friable; fine and medium roots; few very fine tubular pores; few fine vesicular pores; moderately acid; clear smooth boundary.

Cg—21 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; many fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; many fine roots; common very fine and fine tubular pores; slightly

acid; thin strata of sand and gravel occur with depth.

The texture to a depth of 40 inches is dominantly silt loam or very fine sandy loam. Lenses of loamy very fine sand or very fine sand are in some pedons. Unless limed, the soil reaction ranges from strongly acid in the upper part to moderately acid or neutral at a depth of 40 inches.

The A horizon has hue of 10YR to 5Y, value of 3 or 4, and chroma of 2 or 3.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2.

Linlithgo Series

The Linlithgo series consists of very deep, somewhat poorly drained soils formed in recent alluvium. The soils are on flood plains. Slopes range from 0 to 3 percent.

Linlithgo soils are in a drainage sequence with well drained Occum soils, poorly drained Limerick soils, and Fluvaquents and Udifluvents, frequently flooded. Linlithgo soils have mottles, and Occum soils do not. Linlithgo soils are not as gray or as mottled in the B horizon as Limerick soils. Linlithgo soils are not as frequently flooded as Fluvaquents and Udifluvents, which range from well drained to very poorly drained.

Typical pedon of Linlithgo silt loam, in the town of Claverack, 2,000 feet west of Spook Rock Road and 300 feet north of Stony Mill Road:

Ap—0 to 13 inches; dark brown (10YR 3/3) silt loam, light brownish gray (10YR 6/2) dry; moderate medium subangular blocky structure parting to weak very fine granular; very friable; common fine and few medium roots; slightly acid; clear smooth boundary.

A—13 to 21 inches; very dark gray (10YR 3/1) loam; common fine faint dark brown (7.5YR 4/4) mottles; moderate fine and medium subangular blocky structure parting to moderate fine granular; very friable; few fine roots; moderately acid; clear wavy boundary.

Bg1—21 to 29 inches; grayish brown (2.5Y 5/2) silt loam; common fine prominent yellowish brown (10YR 5/8) mottles; weak coarse and moderate subangular blocky structure; friable; few fine roots; few medium vesicular pores; common fine and very fine tubular pores; moderately acid; clear smooth boundary.

Bg2—29 to 37 inches; gray (5Y 6/1) gravelly loam; many medium and coarse prominent strong brown (7.5YR 5/8) and yellowish red (5Y 4/6) mottles (more than 40 percent); weak medium and coarse subangular blocky structure; friable; common fine vesicular pores; few fine tubular pores; 15 percent rock fragments; slightly acid; clear smooth boundary.

2C—37 to 60 inches; grayish brown (10YR 5/2) very gravelly loamy sand; single grain; loose; 60 percent rock fragments; slightly acid.

The thickness of the solum ranges from 16 to 40 inches. Bedrock is at a depth of more than 60 inches. The content of rock fragments ranges from 0 to 5 percent in the A horizon, 0 to 20 percent in the B horizon, and 40 to 60 percent in the 2C horizon. Unlimed, the soil ranges from strongly acid to slightly acid in the A and B horizons and from moderately acid to slightly acid in the C horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. It is silt loam or fine sandy loam. It has weak or moderate, fine or medium granular structure. Consistence is friable or very friable.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. The horizon is mottled. It is silt loam, loam, or fine sandy loam. Structure is weak or medium subangular blocky. Consistence is friable or very friable. The thickness of the B horizon ranges from 1 to 14 inches.

The 2C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 3. It is the very gravelly analogs of sand or loamy sand containing 40 to 60 percent gravel.

Livingston Series

The Livingston series consists of very deep, very poorly drained soils on lacustrine lowlands. The soils formed in very fine textured lacustrine sediments. Slopes range from 0 to 3 percent.

Livingston soils are in an undifferentiated group with fine textured, very poorly drained Madalin soils. Livingston soils are in a drainage sequence with somewhat poorly drained Kingsbury and Rhinebeck soils and moderately well drained Hudson and Vergennes soils. Livingston soils have a darker surface layer and are grayer throughout than the other soils in the sequence.

Typical pedon of Livingston silty clay loam, in an area of Livingston and Madalin soils, in the town of Germantown, 1,000 feet north of Best Road, 1,300 feet east of the intersection of Best and Viewmont Roads:

Ap—0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate very fine and fine subangular blocky structure; friable; many roots; neutral; abrupt smooth boundary.

Bg1—9 to 15 inches; gray (5Y 5/1) clay; common medium distinct light olive brown (2.5Y 5/6) mottles; moderate coarse prismatic structure; very firm; few roots; neutral; clear wavy boundary.

Bg2—15 to 22 inches; dark gray (5Y 4/1) clay; common medium prominent red (2.5YR 5/6) mottles; moderate very coarse prismatic structure; very firm; few roots; neutral; gradual wavy boundary.

BCg—22 to 37 inches; dark grayish brown (2.5Y 4/2) clay; few fine faint red (2.5YR 5/6) mottles and many medium distinct gray (N 5/0) mottles; weak very thick platy structure parting to strong medium subangular blocky; very firm; neutral; clear wavy boundary.

Cg—37 to 60 inches; dark gray (5Y 4/1) varved clay; thin strata of dark yellowish brown (10YR 4/4) silt; very firm; moderately alkaline; strongly effervescent.

The solum thickness is 30 to 48 inches. There generally are no rock fragments. Reaction ranges from strongly acid to mildly alkaline in the solum and is mildly alkaline or moderately alkaline in the substratum.

The A horizon has hue of 5YR to 5Y or is neutral, has value of 2 or 3, and has chroma of 0 or 1. It is clay, silty clay, or silty clay loam.

The B horizon has hue of 10YR to 5Y or is neutral, has value of 4 or 5, and has chroma of 0 to 2. It is clay.

The C horizon has hue of 10YR to 5Y or is neutral, has value of 4 or 5, and has chroma of 0 to 2. It is clay.

Macomber Series

The Macomber series consists of moderately deep, well drained soils formed in loamy glacial till. The soils are on bedrock-controlled glaciated uplands. Slopes range from 3 to 45 percent.

Macomber soils are mapped with somewhat excessively drained, shallow Taconic soils. Macomber soils are similar to Manlius soils but are at an elevation of more than 1,000 feet and are in a frigid temperature regime.

Typical pedon of Macomber channery silt loam, in an area of Macomber-Taconic association, steep, very rocky, in the town of Hillsdale, 500 feet east of Lockwood Road, 0.25 mile south of its intersection with West End Road:

Oe—2 inches to 0; partially decomposed organic material, including leaves and twigs.

A—0 to 6 inches; dark yellowish brown (10YR 4/4) channery silt loam; weak fine granular structure; friable; many fine and medium roots; 25 percent rock fragments, mostly shale; strongly acid; clear smooth boundary.

Bw—6 to 22 inches; light olive brown (2.5Y 5/4) very channery loam; moderate medium subangular blocky structure; friable; few fine and large roots; few medium and common fine and very fine pores; 35 percent rock fragments, mostly shale; strongly acid; clear wavy boundary.

2R—22 inches; hard folded shale bedrock.

The thickness of the solum ranges from 15 to 30 inches. The depth to bedrock ranges from 20 to 40 inches. Rock fragments are mainly shale, slate, phyllite, and quartz. They range in content from 10 to 35 percent in the A horizon, 30 to 60 percent in the B horizon, and 40 to 65 percent in the C horizon. Unless limed, the soil is strongly acid or very strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 4. It is silt loam or loam in the fine earth fraction.

The B horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 to 6. It is silt loam or loam in the fine earth fraction.

Some pedons have a C horizon that has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 6. It is silt loam or loam in the fine earth fraction.

Madalin Series

The Madalin series consists of very deep, very poorly drained soils on lacustrine lowlands. The soils formed in clayey lacustrine sediments. Slopes range from 0 to 3 percent.

Madalin soils are in an undifferentiated group with very fine textured, very poorly drained Livingston soils. Madalin soils are in a drainage sequence with somewhat poorly drained Kingsbury and Rhinebeck soils and moderately well drained Hudson and Vergennes soils. Madalin soils have a darker surface layer and are grayer and more mottled throughout than the other soils in the sequence.

Typical pedon of Madalin silt loam, in an area of Livingston and Madalin soils, in the town of Stuyvesant, 1,000 feet north of County Route 46, 1,500 feet east of powerlines, 0.2 mile west of their intersection with Route 9:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam;

medium fine granular structure; friable; many roots; slightly acid; clear smooth boundary.

Bg—8 to 18 inches; very dark gray (N 3/0) silt loam; many medium prominent strong brown (7.5YR 5/6) mottles; strong coarse prismatic structure parting to weak medium subangular blocky; common fine and very fine pores; slightly acid; abrupt smooth boundary.

Btg1—18 to 29 inches; grayish brown (2.5Y 5/2) silty clay loam; many coarse prominent yellowish brown (10YR 5/8) and dark yellowish brown (10YR 4/4) mottles; strong coarse prismatic structure parting to strong medium angular blocky; firm; sticky, plastic; many fine medium and large pores with thick continuous dark gray (10YR 4/1) clay linings; slightly acid; gradual smooth boundary.

Btg2—29 to 42 inches; gray (5Y 5/1) silty clay; many coarse distinct olive brown (2.5Y 4/4) mottles; weak coarse subangular blocky structure within prisms; firm; sticky, plastic; many fine and medium pores with thin continuous clay linings in pores and on ped surfaces; neutral; gradual smooth boundary.

Cg—42 to 60 inches; gray (5Y 5/1) silty clay; many coarse distinct olive brown (2.5Y 4/4) mottles; massive within poorly defined stratified silt and clay; friable; sticky, plastic; weakly effervescent; mildly alkaline.

The solum thickness ranges from 24 to 48 inches. The depth to carbonates ranges from 24 to 60 inches. The content of rock fragments ranges from 0 to 2 percent in the solum and 0 to 20 percent in the C horizon. Reaction ranges from strongly acid to mildly alkaline in the A horizon and from moderately acid to mildly alkaline in the B horizon. It is mildly or moderately alkaline in the C horizon.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is silt loam, silty clay loam, or silty clay.

The B horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 1 or 2 above a depth of 30 inches and 1 to 6 below a depth of 30 inches. It is silt loam, silty clay loam, silty clay, or clay.

The C horizon has hue of 5YR to 5Y, value of 3 to 5, and chroma of 0 to 3. It is massive within varves.

Manlius Series

The Manlius series consists of moderately deep, well drained to excessively drained, moderately permeable soils on bedrock-controlled glacial till uplands. The soils formed in loamy glacial till with a large content of shale fragments. They are underlain by folded, acid shale bedrock at a depth of 20 to 40 inches. Slopes range from 0 to 25 percent.

Manlius soils are similar to Macomber soils and are commonly near Nassau, Bernardston, and Pittstown soils. Macomber soils are frigid and are at an elevation of 1,000 feet or more. Bernardston and Pittstown soils are very deep and have a firm or very firm substratum.

Typical pedon of Manlius channery silt loam, 3 to 8 percent slopes, in the town of Chatham, 500 feet west of Reed Road and 0.3 mile south of the intersection of Reed Road and Richmond Road:

Ap—0 to 6 inches; dark brown (10YR 3/3) channery silt loam; weak fine granular structure; very friable; common fine and medium roots; 15 percent rock fragments, mostly shale; moderately acid; abrupt smooth boundary.

Bw1—6 to 16 inches; light yellowish brown (10YR 6/4) channery silt loam; moderate medium subangular blocky structure; friable; common fine roots; 30 percent rock fragments, mostly shale; strongly acid; clear smooth boundary.

Bw2—16 to 27 inches; light yellowish brown (10YR 6/4) very channery silt loam; weak fine subangular blocky structure; friable; few fine roots; 55 percent rock fragments; very strongly acid; abrupt smooth boundary.

Cr—27 to 34 inches; fractured shale bedrock with yellowish brown (10YR 5/4) silt loam between rock fragments; very strongly acid; diffuse wavy boundary.

R—34 inches; brown (10YR 3/3) and greenish gray (5G 5/1) hard folded shale bedrock interbedded with red and green shale.

The solum thickness ranges from 15 to 30 inches. The depth to bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 15 to 40 percent in the Ap horizon and 30 to 60 percent in the B and C horizons. Reaction ranges mainly from extremely acid to strongly acid in the solum and very strongly acid to slightly acid in the C horizon. In limed areas the A horizon ranges to neutral.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 or 3. In the fine earth fraction it is loam or silt loam. Structure is weak, fine or medium granular. Consistence is friable or very friable.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 to 6. In the fine earth fraction it is loam or silt loam. Structure is weak or very weak, fine

or medium granular or subangular blocky. Consistence is friable or firm.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. In the fine earth fraction it is loam or silt loam. Consistence is loose to firm.

Massena Series

The Massena series consists of very deep, somewhat poorly drained to poorly drained soils on glacial till uplands. The soils formed in loamy, calcareous glacial till. Slopes range from 0 to 8 percent.

Massena soils are similar to Punsit soils and are commonly adjacent to Georgia, Stockbridge, and Sun soils. Punsit soils formed in acid glacial till and have a firmer substratum. Moderately well drained Georgia soils and well drained Stockbridge soils are not as gray or as mottled as Massena soils. Very poorly drained and poorly drained Sun soils are grayer immediately below the surface layer and have a darker surface layer than Massena soils.

Typical pedon of Massena silt loam, 0 to 3 percent slopes, in the town of Hillsdale, 150 feet south of the intersection of the Shunpike and Marsten Lane:

A—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam; weak very fine granular structure; friable; nonsticky, nonplastic; 5 percent rock fragments; many fine and medium roots; neutral; clear smooth boundary.

Bw1—7 to 13 inches; dark grayish brown (2.5Y 4/2) loam; many (45 percent) fine and prominent dark yellowish brown (10YR 4/6), olive (5Y 5/3), and red (2.5YR 4/8) mottles; weak fine subangular blocky structure; friable; nonsticky, nonplastic; 5 percent rock fragments; many fine roots; neutral; abrupt smooth boundary.

Bw2—13 to 23 inches; dark grayish brown (2.5Y 4/2) loam; many medium prominent olive (5Y 5/6) mottles; weak medium subangular blocky structure; friable; nonsticky, nonplastic; 10 percent rock fragments; neutral; gradual wavy boundary.

C1—23 to 46 inches; dark grayish brown (2.5Y 4/2) loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; massive; friable; nonsticky, nonplastic; 10 percent coarse fragments; neutral; gradual smooth boundary.

C2—46 to 80 inches; dark grayish brown (2.5Y 4/2) loam; common fine prominent yellowish brown (10YR 5/6) mottles; massive; 10 percent rock fragments; mildly alkaline; weakly effervescent.

The thickness of the solum ranges from 18 to 37 inches. The depth to carbonates ranges from 20 to 50 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 5 to 35 percent in the solum and from 5 to 50 percent in the C horizon.

Reaction ranges from moderately acid to neutral in the solum and from neutral to moderately alkaline in the C horizon.

The A horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 1 or 2. It ranges from sandy loam to silt loam in the fine earth fraction. Structure is weak or moderate, fine or very fine granular. Consistence is friable or very friable.

The B horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 4 and is mottled. It is fine sandy loam, loam, or silt loam. Structure is weak, medium or fine subangular blocky, or it is massive. Consistence is friable or very friable.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is massive or platy and has firm or friable consistence.

Monarda Series

The Monarda series consists of very deep, poorly drained soils on glaciated uplands at an elevation of more than 1,000 feet. The soils formed in firm, acid glacial till. Slopes range from 3 to 15 percent.

Monarda soils are mapped with well drained Lanesboro soils, which are not as gray and do not have mottles. Monarda soils and Alden soils formed in similar material, but Monarda soils are at a higher elevation and are in a frigid temperature regime.

Typical pedon of Monarda channery silt loam, in an area of Lanesboro-Monarda association, strongly sloping, very rocky, in the town of Hillsdale, 300 feet northwest of NY Route 22, 1 mile north of the intersection of NY Route 22 and Columbia County Route 7D:

Ap—0 to 7 inches; brown (10YR 4/3) channery silt loam; weak fine granular structure; very friable; 16 percent rock fragments; many fine and medium roots; extremely acid; abrupt smooth boundary.

Bw1—7 to 14 inches; light yellowish brown (2.5Y 6/4) channery silt loam; many fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; 27 percent rock fragments; many fine and common medium roots; common fine vesicular pores; extremely acid; abrupt smooth boundary.

Bw2—14 to 20 inches; light brownish gray (2.5Y 6/2) channery silt loam; many (more than 40 percent) fine distinct yellowish brown (10YR 5/6) mottles; thin platy structure; friable; 17 percent rock fragments; few fine roots; common fine and very fine tubular pores; very strongly acid; abrupt smooth boundary.

Cd—20 to 60 inches; grayish brown (2.5Y 5/2) channery silt loam; massive within weak very coarse prisms; gray (5Y 6/1) prism streaks; yellowish brown (10YR 5/8) rind around streaks; very firm; brittle (dry); 22 percent rock fragments; occasional thin patchy clay flows along faces of prisms; common fine vesicular pores; strongly acid.

The thickness of the solum ranges from 12 to 30 inches. The content of rock fragments ranges from 3 to 35 percent, by volume. Reaction is extremely acid to strongly acid in the surface layer and subsoil and very strongly acid or strongly acid in the substratum.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 to 3. It is silt loam, loam, or the channery analogs of those textures.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It is mottled. It is silt loam, loam, or very fine sandy loam or the channery analogs of those textures.

The Cr horizon has hue of 2.5Y, 5Y, or 5G; value of 4 to 6; and chroma of 1 to 4. It is mottled. It is silt loam, loam, or very fine sandy loam or their gravelly analogues. It is massive or has coarse or very coarse prismatic structure.

Nassau Series

The Nassau series consists of shallow, somewhat excessively drained soils on bedrock-controlled uplands. The soils formed in loamy, acid glacial till with a high shale content. Slopes are complex and irregular and range from 1 to 35 percent.

Nassau soils are similar to Taconic soils and are commonly adjacent to Manlius, Bernardston, and Pittstown soils. Taconic soils are in a frigid temperature regime and are at elevation of 1,000 feet or more. Bernardston and Pittstown soils are very deep and have a firm or very firm substratum.

Typical pedon of Nassau channery silt loam, in an area of Nassau channery silt loam, rolling, very rocky, in the town of Chatham, 600 feet west of Reed Road, 0.3 mile south of the intersection of Reed Road and Richmond Road:

Ap—0 to 3 inches; dark brown (10YR 3/3) channery silt loam; weak fine granular structure; very friable; common fine and medium roots; 30 percent rock fragments (mostly shale); strongly acid; abrupt smooth boundary.

Bw—3 to 17 inches; yellowish brown (10YR 5/4) very channery silt loam; weak fine subangular blocky structure; friable; few fine roots; 45 percent rock fragments; strongly acid; abrupt smooth boundary.

R—17 inches; brown (10YR 4/3) and gray (5Y 5/1) hard folded shale bedrock interbedded with red and green shale.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. Rock fragments are mainly slate and shale, and their content ranges from 10 to 50 percent in the Ap horizon and 35 to 70 percent in the B horizon. That content includes 0 to 20 percent coarse shale in the Ap horizon and 10 to 20 percent coarse shale below the Ap horizon. Reaction is very strongly acid or strongly acid.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 or 3. It is loam or silt loam in the fine earth fraction. It has weak or moderate, medium or fine, granular structure.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 8. It is loam or silt loam in the fine earth fraction. It has weak or moderate, medium or fine, subangular blocky structure.

Some thicker pedons have a thin C horizon immediately above the bedrock.

Niagara Series

The Niagara series consists of very deep, somewhat poorly drained soils on lake plains. The soils formed in silty, calcareous lacustrine sediments. Slopes range from 0 to 8 percent.

Niagara soils are in a drainage sequence with moderately well drained Collamer soils and poorly drained to very poorly drained Canandaigua soils. Niagara soils are grayer in the B horizon than Collamer soils and are not as gray or as mottled as Canandaigua soils. Niagara soils are similar to Raynham and Rhinebeck soils but have more clay in the B horizon than Raynham soils and not as much clay as the Rhinebeck soils.

Typical pedon of Niagara silt loam, 0 to 3 percent slopes, in the town of Germantown, 500 feet east of Viewmont Road and 1,500 feet south of its intersection with Best Road:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

Bw—8 to 12 inches; olive brown (2.5Y 4/4) silt loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; friable; few fine and medium roots; many fine tubular pores; slightly acid; gradual wavy boundary.

Bt1—12 to 18 inches; grayish brown (2.5Y 5/2) silt loam; many medium prominent yellowish brown (10YR 5/6) mottles; strong medium angular blocky structure; firm; few fine roots; common very fine tubular pores; 1-millimeter-thick clay coats in root channels and large pores; thin discontinuous clay coats on ped surfaces; slightly acid; gradual wavy boundary.

Bt2—18 to 23 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/4) mottles; strong coarse angular blocky structure; firm; common very fine tubular pores; 1-millimeter-thick clay coats in root channels, in large pores, and on ped faces; neutral; clear smooth boundary.

C1—23 to 26 inches; light brownish gray (2.5Y 6/2) thickly bedded layers of silt; common coarse prominent yellowish brown (10YR 5/6) mottles; firm; neutral; clear smooth boundary.

C2—26 to 60 inches; light brownish gray (2.5Y 6/2) stratified layers of silt and clay; massive; firm; occasional pockets of very fine sand; neutral; very slightly effervescent.

The thickness of the solum ranges from 20 to 40 inches. The depth to carbonates ranges from 20 to 50 inches. The content of coarse fragments is few or none.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 or 3. It is very fine sandy loam, loam, or silt loam. Structure is weak or moderate, fine granular. Reaction is strongly acid to neutral. Consistence is friable or very friable.

Some pedons have an E horizon that has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 2 or 3. It is fine sandy loam, very fine sandy loam, loam, or silt loam. It has weak, fine, subangular blocky and weak, thin, platy structure, or it is massive.

The Bt horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 2 or 4 and is 40 percent faint to prominent mottles. It mainly is silt loam, very fine sandy loam, or silty clay loam and thin continuous subhorizons of finer or coarser textured material in some pedons. The Bt horizon has subangular or angular blocky structure. There are thin patchy or continuous clay skins on ped surfaces. Consistence is friable or firm. Reaction is moderately acid to mildly alkaline.

The C horizon has hue of 5YR to 2.5Y, value of 3 to 6, and chroma of 2 or 3. It is stratified layers of fine sand to clay. Reaction is neutral to moderately alkaline.

Occum Series

The Occum series consists of very deep, well drained soils formed in recent alluvium. The soils are on flood plains. Slopes range from 0 to 3 percent.

Occum soils are in a drainage sequence with somewhat poorly drained Linlithgo soils, poorly drained Limerick soils, and well drained to very poorly drained, frequently flooded Fluvaquents and Udifluvents. Occum soils do not have mottles, as do Linlithgo and Limerick soils, and are not as frequently flooded as the Fluvaquents and Udifluvents.

Typical pedon of Occum loam, in the town of Greenport, 600 feet east of Spook Rock Road, and 0.7 miles south of its intersection with Webb Road:

Ap—0 to 10 inches; dark brown (10YR 3/3) loam; moderate medium subangular blocky structure parting to weak fine granular; friable; many fine and medium roots; moderately acid; abrupt smooth boundary.

Bw1—10 to 25 inches; brown (10YR 4/3) fine sandy loam; moderate medium and coarse subangular blocky structure; friable; common fine and few medium roots; many fine vesicular pores and few fine and medium tubular pores; few medium faint dark brown (7.5YR 4/4) mottles in the lower 3 inches; moderately acid; clear smooth boundary.

Bw2—25 to 33 inches; dark yellowish brown (10YR 4/4) coarse sandy loam; weak coarse subangular blocky structure; very friable; few fine roots; common fine tubular pores; 4 percent rock fragments; moderately acid; abrupt smooth boundary.

2C—33 to 60 inches; light brownish gray (10YR 6/2), dark brown (10YR 4/3), and brown (10YR 5/3) stratified sand and gravel; single grain; loose; 60 percent rock fragments; common fine and few medium pores in upper part; moderately acid.

The thickness of the solum ranges from 20 to 36 inches. The content of rock fragments ranges from 0 to 5 percent in the solum and from 40 to 60 percent in the C horizon. Unless limed, the soil ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is fine sandy loam, loam, or sandy loam.

The B horizon has hue of 10YR, value of 3 to 5, and chroma of 3 to 6. It mainly is fine sandy loam or sandy loam. Some pedons have thin sand lenses up to 2 inches thick.

The C horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 4. It mainly is stratified sand and gravel. Thin strata of silt loam to fine sandy loam are in some pedons.

Ovid Series

The Ovid series consists of very deep, somewhat poorly drained soils on uplands. The soils formed in calcareous glacial till derived from red shale. Slopes are smooth and range from 0 to 8 percent.

Ovid soils are in a drainage sequence with and are generally near well drained and moderately well drained Cazenovia soils. Cazenovia soils are not as gray as Ovid soils and are not as mottled. Ovid soils are similar to Punsit soils, but Ovid soils are redder and have more clay in the subsoil.

Typical pedon of Ovid silt loam, 0 to 3 percent slopes, in the town of New Lebanon, 400 feet west of County Route 9, and 0.2 mile north of its intersection with Haddock Hill Road:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; friable; nonsticky, nonplastic; many fine and common medium roots; 1 percent rock fragments; moderately acid; clear smooth boundary.

E—8 to 13 inches; brown (7.5YR 5/2) silt loam; few fine prominent yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable; nonsticky, nonplastic; many fine and few medium roots; common fine and very fine pores; 1 percent rock fragments; few clean sand grains; moderately acid; clear smooth boundary.

Bt1—13 to 19 inches; brown (7.5YR 4/4) silty clay loam; few fine distinct olive yellow (2.5Y 6/6) mottles; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; many fine pores with clay linings; reddish gray (5YR 5/2) surfaces of peds and common distinct clay films on faces of peds; 5 percent rock fragments; moderately acid; clear wavy boundary.

Bt2—19 to 34 inches; reddish gray (5YR 5/2) silty clay loam; few fine distinct yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; many fine pores with clay linings; 12 percent rock fragments; slightly acid; clear smooth boundary.

C—34 to 80 inches; brown (7.5YR 4/4) silty clay loam; massive; firm; slightly sticky, slightly plastic; mildly alkaline; slightly effervescent.

The thickness of the solum ranges from 20 to 40 inches and the depth to carbonates from 18 to 40 inches. The content of rock fragments ranges from 1 to 25 percent and typically increases with depth.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 1 to 3. It ranges from fine sandy loam to silty clay loam. It has weak or moderate granular or subangular blocky structure and is moderately or slightly acid.

The E horizon has hue of 7.5YR or 5YR, value of 5 or 6, and chroma of 2 or 3 and is mottled.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 2 to 4. It has few to many, distinct and faint, higher and lower chroma mottles. It is clay loam or silty clay loam; the average clay content is 28 to 35 percent. Structure is moderate or strong, medium or coarse subangular blocky. Reaction is moderately acid to neutral. The lower part of the solum is calcareous in some pedons.

The C horizon is similar to the B horizon in color and texture. It has weak or moderate platy structure and is mildly alkaline or moderately alkaline.

Palms Series

The Palms series consists of very deep, very poorly drained soils formed in highly decomposed organic material 16 to 51 inches thick over mineral soil. These soils are in kettles, in outwash plains, in troughs in folded bedrock, in impounded areas on uplands, and in bogs, swamps, and alluvial plains on uplands and lowlands. Slopes range from 0 to 1 percent.

Palms soils are on the same landscape setting as Carlisle soils. Carlisle soils formed in organic deposits thicker than 51 inches. Palms soils are commonly near Limerick soils, which formed in recent alluvium and do not have an organic layer 16 inches thick.

Typical pedon of Palms muck, in the town of Chatham, 1,500 feet south of Columbia County Route 32, and 0.1 mile west of the intersection of Route 32 and Woodward Road:

Oa1—0 to 12 inches; black (10YR 2/1) muck; weak fine granular structure; nonsticky; many fine roots; 5

percent fibers unrubbed; moderately acid; gradual smooth boundary.
Oa2—12 to 16 inches; black (10YR 2/1) muck; very weak coarse subangular blocky structure; nonsticky; many fine roots; 15 percent fibers unrubbed; moderately acid; gradual smooth boundary.
Oa3—16 to 20 inches; very dark grayish brown (10YR 3/2) muck; massive; nonsticky; 5 percent fibers unrubbed; slightly acid; abrupt smooth boundary.
2Cg1—20 to 34 inches; gray (2.5Y 5/1) silt loam; massive; nonsticky, slightly plastic; many fine and medium roots; 5 percent rock fragments; slightly acid; clear smooth boundary.
2Cg2—34 to 60 inches; greenish gray (5BG 5/1) fine sandy loam; massive; 10 percent rock fragments; neutral; carbonates at 60 inches.

The depth to the 2C horizon is 16 to 50 inches. Reaction of the organic material is strongly acid to mildly alkaline. Reaction of the 2C horizon is slightly acid to moderately alkaline.

The surface tier has hue of 5YR to 10YR, value of 2, and chroma of 0 to 2. The subsurface tiers have hue of 5YR to 10YR, value of 2 to 4, and chroma of 0 to 3. The texture of the organic tiers is muck.

The 2Cg horizon has hue of 10YR to 5BG, value of 3 to 7, and chroma of 1 or 2. It is sandy loam, fine sandy loam, loam, silty clay loam, or silt loam.

Pittstown Series

The Pittstown series consists of very deep, moderately well drained soils formed in acidic glacial till deposits on uplands. Slopes range from 3 to 25 percent.

Pittstown soils are in a drainage sequence with well drained Bernardston soils, somewhat poorly drained Punsit soils, and very poorly drained Alden soils. Pittstown soils are mottled above the substratum; Bernardston soils are not mottled above the substratum. Pittstown soils are not as gray or as mottled as Punsit and Alden soils. Pittstown soils and Stockbridge soils and Georgia soils are on similar landscapes, but the Stockbridge and Georgia soils formed in calcareous glacial till.

Typical pedon of Pittstown silt loam, 8 to 15 percent slopes, in the town of New Lebanon, 300 feet east of McGrath Hill Road, 0.2 mile north of its intersection with Kelly Road:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.
Bw1—8 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; 5 percent rock fragments; strongly acid; clear smooth boundary.
Bw2—15 to 21 inches; light olive brown (2.5Y 5/4) silt loam; few medium prominent yellowish brown (10YR 5/8) mottles; strong medium subangular blocky structure; friable; few fine roots; few medium vesicular pores; 10 percent rock fragments; strongly acid; clear wavy boundary.
Cd—21 to 60 inches; dark grayish brown (2.5Y 4/2) silt loam; common coarse prominent yellowish brown (10YR 5/8) mottles; massive with weak coarse prisms; very firm; brittle; common fine tubular pores; 10 percent rock fragments; strongly acid.

The thickness of solum ranges from 15 to 30 inches and generally corresponds to the depth to the firm substratum. The content of rock fragments ranges from 0 to 20 percent in the surface layer and subsoil and from 10 to 30 percent in the substratum. Unless limed, the soil ranges from very strongly acid to moderately acid.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. It is silt loam, very fine sandy loam, or loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is silt loam, very fine sandy loam, or loam and is mottled.

The Cr horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. It is silt loam, very fine sandy loam, or loam. Consistence is firm or very firm.

Punsit Series

The Punsit series consists of very deep, somewhat poorly drained soils on glaciated uplands. The soils formed in medium-textured, nonacid glacial till. Slopes range from 0 to 15 percent.

Punsit soils are similar to Massena soils and are in a drainage sequence with well drained Bernardston soils, moderately well drained Pittstown soils, and very poorly drained Alden soils. Massena soils are not as firm in the substratum as Punsit soils. Bernardston and Pittstown soils are not as gray or as mottled as Punsit soils. Alden soils have a darker surface layer and are grayer throughout than Punsit soils.

Typical pedon of Punsit silt loam, 0 to 3 percent slopes, in the town of Austerlitz, 300 feet west of County Route 7 and 0.9 mile south of the intersection of

Schoolhouse Road and County Route 7:

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable; 5 percent rock fragments; many fine roots; moderately acid; abrupt smooth boundary.

Bg1—6 to 11 inches; grayish brown (2.5Y 5/2) silt loam; many (more than 40 percent) fine and medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; 10 percent rock fragments; common fine tubular pores; common fine roots; slightly acid; clear smooth boundary.

Bg2—11 to 23 inches; gray (5Y 6/1) gravelly loam; common fine and medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; 20 percent rock fragments; common very fine and fine tubular pores; slightly acid; clear smooth boundary.

Cd—23 to 60 inches; olive gray (5Y 5/2) loam; common coarse prominent yellow (10YR 7/8) mottles; massive; firm; 10 percent rock fragments; common very fine and fine tubular pores; common very dark grayish brown (10YR 3/2) stains; slightly acid.

The solum thickness is 15 to 30 inches. The texture in the fine earth is loam or silt loam throughout and more than 50 percent silt and very fine sand. The content of rock fragments ranges from 5 to 25 percent in the surface layer and subsoil and from 10 to 35 percent in the substratum. Reaction is slightly acid or moderately acid.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The upper part of the B horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3. The lower part has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 1 or 2.

The Cr horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 or 3. It is firm or very firm.

Raynham Series

The Raynham series consists of very deep, poorly drained soils on lacustrine plains. The soils formed in water-sorted sediments, mainly silt and very fine sand. Slopes are smooth and range from 0 to 3 percent.

Raynham soils are in a drainage sequence with well drained Unadilla soils, moderately well drained Scio soils, and very poorly drained Birdsall soils. Raynham soils are grayer in the subsoil than Unadilla or Scio soils and have a lighter colored surface layer than Birdsall soils. Raynham soils and Niagara and Canandaigua soils formed in similar sediments. Niagara and Canandaigua soils both have more clay in the subsoil than Raynham soils.

Typical pedon of Raynham very fine sandy loam, 1.3 miles south of Tuzinski Road and 500 feet east of Columbia County Route 21:

Ap—0 to 10 inches; dark grayish brown (2.5Y 4/2) very fine sandy loam; medium coarse subangular blocky structure parting to strong fine granular; friable; many fine and medium roots; few large and many medium and fine pores; neutral (limed); abrupt smooth boundary.

Bw1—10 to 16 inches; grayish brown (2.5Y 5/2) very fine sandy loam; many medium distinct strong brown (7.5YR 5/8) mottles and a few fine faint light olive brown (2.5Y 5/4) mottles; weak medium subangular blocky structure; friable; few medium and common fine roots; many medium and common fine pores; slightly acid; clear irregular boundary.

Bw2—16 to 21 inches; yellowish brown (10YR 5/4) very fine sandy loam; many medium distinct grayish brown (2.5Y 5/2) mottles; weak thin platy structure parting to weak very fine subangular blocky; friable; common medium and few fine roots; few large, many medium, and few fine pores; moderately acid; clear smooth boundary.

Cg1—21 to 40 inches; grayish brown (2.5Y 5/2) very fine sandy loam; many medium distinct strong brown (7.5YR 5/5) mottles; weak medium platy structure within stratified layers; firm; few fine and few medium roots; few large, many medium, and few fine pores; moderately acid; clear smooth boundary.

Cg2—40 to 60 inches; light brownish gray (10YR 6/2) silt and dark grayish brown (2.5Y 4/2) very fine sand; massive within stratified layers; firm; few medium and few fine pores; moderately acid.

The thickness of the solum ranges from 16 to 37 inches. The content of rock fragments ranges from mainly 0 to no more than 2 percent, by volume, throughout the soil. Some pedons have thin (1 to 3 inches thick) layers of sandy material in the B or C horizons. Reaction ranges from strongly acid to neutral in the surface layer and subsoil and from moderately acid to mildly alkaline in the substratum.

The Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 3. It is silt loam, very fine sandy loam, or silt.

The B horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 2 to 4; one or more subhorizons has

chroma of 2. Mottles are distinct or prominent. The B horizon is silt loam or very fine sandy loam. Structure is weak or moderate, fine to medium granular, subangular blocky, or platy.

The C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It is silt loam or very fine sandy loam or has thin strata that range from silt to fine sand. It is massive or platy. Consistence is friable or firm. Mottles are distinct or prominent.

Rhinebeck Series

The Rhinebeck series consists of very deep, somewhat poorly drained soils on dissected lake plains. The soils formed in clayey, nonacid lacustrine sediments. Slopes range from 0 to 8 percent.

Rhinebeck soils are in an undifferentiated group with more clayey Kingsbury soils. Rhinebeck soils are in a drainage sequence with and commonly are adjacent to moderately well drained Hudson and Vergennes soils and very poorly drained Madalin soils. Hudson and Vergennes soils are not as gray as Rhinebeck soils; Madalin soils are darker and grayer than Rhinebeck soils.

Typical pedon of Rhinebeck silt loam, in an area of Kingsbury and Rhinebeck soils, 0 to 3 percent slopes, in the town of Stuyvesant, 0.5 mile west of the intersection of Hollow Road and Eickybush Road, 0.6 mile south of Hollow Road, 50 feet east of the powerlines:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine subangular blocky structure; friable; many fine roots; many fine pores; moderately acid; abrupt smooth boundary.

E—10 to 12 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent strong brown (7.5YR 5/8) mottles and common fine distinct gray (5Y 6/1) mottles; moderate fine and medium subangular blocky structure; friable; common fine roots; common fine pores; strongly acid; clear wavy boundary.

Bt1—12 to 19 inches; grayish brown (10YR 5/2) silty clay; moderate medium distinct strong brown (10YR 5/6) mottles and moderate medium distinct gray (10YR 6/1) mottles; moderate coarse prisms separating to moderate medium subangular blocky structure; firm; common fine roots; common fine pores; light brownish gray (2.5Y 6/2) silt coatings on faces of peds in upper 3 inches; clay films on faces of peds and in pores; strongly acid; clear smooth boundary.

Bt2—19 to 29 inches; dark brown (10YR 4/3) silty clay; many medium distinct gray (5Y 6/1) mottles and many medium distinct strong brown (7.5YR 5/6) and dark brown (7.5YR 4/4) mottles; weak coarse prisms separating to weak medium subangular blocky structure; firm; common fine roots; few fine pores; coatings of gray (10YR 5/1) clay films on faces of prisms and faces of peds; moderately acid; clear wavy boundary.

C1—29 to 50 inches; grayish brown (2.5Y 5/2) and dark brown (10YR 4/3) silty clay; many medium distinct gray (5Y 6/1) mottles and many medium distinct strong brown (7.5YR 5/6) and dark brown (7.5YR 4/4) mottles; massive within varved layers of silt and clay; firm; few fine roots; moderately alkaline; strongly effervescent; clear wavy boundary.

C2—50 to 60 inches; varved grayish brown (2.5Y 5/2) clay and dark brown (10YR 4/3) silt; massive within varves; firm; moderately alkaline; strongly effervescent.

The thickness of the solum ranges from 20 to 40 inches. The depth to carbonates ranges from 20 to 60 inches. The reaction of the surface layer is strongly acid to neutral. The subsoil ranges from strongly acid to mildly alkaline, and the C horizon is slightly acid to moderately alkaline. The content of rock fragments ranges from 0 to 25 percent in the A horizon and from 0 to 10 in the B and C horizons.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 1 to 3. It is silt loam or silty clay loam.

The E horizon has hue of 7.5YR to 5Y, value of 4 to 6, chroma of 1 to 3 and is mottled. It is silt loam, very fine sandy loam, or silty clay loam.

The Bt horizon has hue of 7.5YR to 5Y, value of 3 to 5, and chroma of 2 to 4 and is mottled. It is silty clay loam, silty clay, or clay. Consistence is firm or very firm.

The C horizon has hue of 5YR to 5Y, value of 3 to 5, and chroma of 1 to 4. It mainly is silty clay loam to clay; some subhorizons range to fine sand. This horizon is massive with or without varving.

Saprists

Saprists consist of very deep, very poorly drained soils formed in organic deposits in concave areas and impounded areas on lacustrine and outwash plains and on till uplands. Slopes range from 0 to 3 percent.

Saprists are mapped with Aquents. Aquents formed in mineral material. Saprists are commonly near Carlisle, Palms, Halsey, Limerick, and Alden soils, all of

which formed in more uniform deposits.

Because the organic deposits of Saprists are variable in thickness, a typical pedon is not provided. The organic deposits are 16 to 60 inches thick. The depth to bedrock is more than 60 inches.

The organic layers have hue of 10YR to 5Y, value of 1 or 2, and chroma of 0 or 1. They are dominantly muck but contain varying amounts of hemic material. The substratum ranges from silty clay to loamy sand and their mucky analogs. There are no rock fragments in the organic layers, and their content ranges from 0 to 45 percent in the mineral layers. Reaction ranges from strongly acid to mildly alkaline throughout.

Scio Series

The Scio series consists of very deep, moderately well drained soils on dissected lacustrine lowlands. The soils formed in silty, water-sorted sediments. Slopes are smooth and range from 0 to 8 percent.

Scio soils are in a drainage sequence with well drained Unadilla soils, poorly drained Raynham soils, and very poorly drained Birdsall soils. Unadilla soils are not mottled, Raynham soils are grayer than Scio soils, and Birdsall soils are gray and have a dark surface layer.

Typical pedon of Scio silt loam, 0 to 3 percent slopes, in the town of Livingston, 0.6 mile west of County Route 31, 0.4 mile south of its intersection with Wire Road:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common roots; moderately acid; abrupt smooth boundary.

Bw1—9 to 20 inches; light olive brown (2.5Y 5/4) silt loam; few medium faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; few fine roots; common very fine tubular pores; moderately acid; clear smooth boundary.

Bw2—20 to 31 inches; light olive brown (2.5Y 5/4) silt loam; common fine distinct gray (5Y 6/1) mottles and common fine faint light olive brown (2.5Y 5/6) mottles; moderate medium subangular blocky structure; common very fine tubular pores; common fine vesicular pores; strongly acid; clear smooth boundary.

C—31 to 80 inches; olive (5Y 5/3) very fine sand, pinkish gray (5YR 6/2) clay, and gray (5Y 6/1) silt in thin stratified layers; massive within layers; grayish brown (2.5Y 5/2) crushed color; friable; moderately acid.

The solum thickness ranges from 20 to 36 inches. Unless limed, the soil is very strongly acid to moderately acid in the surface layer and subsoil. It is strongly acid to mildly alkaline in the substratum. The depth to free carbonates is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent above a depth of 40 inches and 5 to 60 inches below.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3. It is silt loam or very fine sandy loam. Structure is weak or moderate, fine or medium, granular or subangular blocky. Consistence is friable or very friable.

The B horizon has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 3 to 6. It is mottled with lower and higher chromas. It is silt loam or very fine sandy loam. Structure is weak or moderate, platy, prismatic, or subangular blocky. Consistence is friable or very friable.

The C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It is silt loam to stratified sand and gravel. It is massive or single grain or has weak, platy structure.

Shaker Series

The Shaker series consists of very deep, somewhat poorly drained soils on lacustrine lowlands. The soils formed in coarse-loamy over clayey lake sediments. Slopes range from 0 to 3 percent.

Shaker soils are in a drainage sequence with moderately well drained Elmridge soils. Shaker soils and Raynham soils are in similar landscape settings. Raynham soils are darker and grayer than Shaker soils and do not have a clayey substratum.

Typical pedon of Shaker loam, in the town of Stockport, 150 feet south of Day Road and 500 feet west of Route 9J:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

Bw1—10 to 16 inches; light brownish gray (10YR 6/2) loam; many fine prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; many very fine and fine tubular pores; moderately acid; clear smooth boundary.

Bw2—16 to 22 inches; light brownish gray (10YR 6/2) fine sandy loam; many (45 percent) coarse prominent yellowish brown (10YR 5/8) mottles; weak fine granular structure; friable; slightly acid; abrupt smooth boundary.

2Cg1—22 to 49 inches; gray (10YR 5/1) silty clay loam; many (more than 40 percent) coarse prominent yellowish brown (10YR 5/8), brown (10YR 5/3), and pinkish gray (7.5YR 6/2) mottles; weak medium platy structure; firm; neutral; abrupt smooth boundary.

2Cg2—49 to 80 inches; gray (10YR 5/1) stratified layers of silt and clay; many (more than 40 percent) coarse prominent yellowish brown (10YR 5/8), brown (10YR 5/3), and pinkish gray (7.5YR 6/2) mottles; firm; mildly alkaline; slightly effervescent.

The thickness of the solum and the depth to underlying clayey material range from 18 to 40 inches. The content of rock fragments ranges from 0 to 5 percent in the solum and from 0 to 2 percent in the 2C horizon. Unless limed, the soil ranges from strongly acid to neutral in the solum and from moderately acid to mildly alkaline in the 2C horizon.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 or 2. It is sandy loam, loam, fine sandy loam, or very fine sandy loam.

The upper part of the B horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 or 3. The lower part has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. The B horizon is fine sandy loam, sandy loam, or loam.

The 2C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It is silty clay loam, silty clay, or clay. It has weak, medium or thick, platy structure, or it is massive. Consistence is firm or very firm.

Stockbridge Series

The Stockbridge series consists of very deep, well drained soils on till plains. The soils formed in calcareous, loamy glacial till. Slopes range from 3 to 35 percent.

Stockbridge soils are in a drainage sequence with moderately well drained Georgia soils, somewhat poorly drained Massena soils, and poorly drained and very poorly drained Sun soils. Stockbridge soils are not mottled and are not as gray as the other soils in the sequence. Stockbridge soils and Bernardston soils are on similar landscapes, but Bernardston soils formed in acid glacial till and have a firmer substratum.

Typical pedon of Stockbridge silt loam, 15 to 25 percent slopes, in the town of Ancram, 100 feet west of Under Mountain Road, and 0.5 mile north of its intersection with Boston Corners Road:

Ap—0 to 9 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; common fine and very fine roots; 10 percent rock fragments; slightly acid; clear smooth boundary.

Bw1—9 to 17 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; few fine and very fine roots; 10 percent rock fragments; slightly acid; clear smooth boundary.

Bw2—17 to 29 inches; olive brown (2.5Y 4/4) silt loam; moderate medium subangular blocky structure; friable; few fine and very fine roots; few fine tubular pores; 10 percent rock fragments; neutral; gradual wavy boundary.

C1—29 to 55 inches; dark grayish brown (2.5Y 4/2) gravelly silt loam; massive; firm; 15 percent rock fragments; neutral; gradual smooth boundary.

C2—55 to 60 inches; dark grayish brown (2.5Y 4/2) gravelly silt loam; massive; firm; 15 percent rock fragments; mildly alkaline; slightly effervescent.

The solum thickness ranges from 20 to 40 inches. The depth to carbonates is 40 to 80 inches. The content of rock fragments ranges from 5 to 35 percent in the solum and from 3 to 50 percent in the substratum. The soil reaction ranges from strongly acid to neutral in the solum and from moderately acid to moderately alkaline in the substratum.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is very fine sandy loam, fine sandy loam, or silt loam. It is friable or very friable and has weak, fine, or medium granular structure.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 7. It is loam or silt loam in the fine earth fraction. It is friable to firm and has weak or moderate, fine to coarse, subangular blocky structure.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 to 4. It mainly is loam or silt loam, but in some pedons it is fine sandy loam below a depth of 40 inches. It is firm or very firm. It has weak, thick, platy structure or is massive.

Sun Series

The Sun series consists of very deep, very poorly and poorly drained soils on glaciated uplands. The soils formed in medium-textured, calcareous glacial till. Slopes range from 0 to 3 percent.

Sun soils are in a drainage sequence with well drained Stockbridge soils, moderately well drained Georgia soils, and somewhat poorly drained Massena soils. Sun soils have a darker surface layer and are grayer and more mottled throughout than any of the

other soils in the sequence. Sun soils and Alden soils formed in similar material and are in similar landscape settings. Sun soils formed in high lime till and are not as firm in the substratum as Alden soils.

Typical pedon of Sun silt loam, in the town of Hillsdale, 100 feet south of Holm Road and 0.3 mile west of the intersection of Holm Road and Mitchell Street:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam; weak very fine granular structure; friable; nonsticky, nonplastic; many fine and very fine roots; slightly acid; abrupt smooth boundary.

Bg1—8 to 16 inches; gray (N 5/0) loam; common medium distinct olive (5Y 5/3) and yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure; friable; nonsticky, nonplastic; common very fine and fine roots; few very fine and fine pores; 10 percent rock fragments; neutral; clear smooth boundary.

Bg2—16 to 25 inches; grayish brown (2.5Y 5/2) sandy loam; many (45 percent) medium distinct olive (5Y 5/3) and yellowish brown (10YR 5/4) mottles; weak prismatic parting to moderate fine subangular blocky structure; friable; nonsticky, nonplastic; few fine and very fine pores; 10 percent rock fragments; neutral; gradual wavy boundary.

Cg—25 to 60 inches; grayish brown (2.5Y 5/2) gravelly loam; common medium distinct olive brown (2.5Y 4/4) mottles; massive; firm; many fine and very fine pores; 20 percent rock fragments; bluish gray (5B 5/1) streaks; neutral; slightly effervescent.

The thickness of the solum ranges from 20 to 40 inches. The depth to carbonates is 20 to 70 inches. The content of rock fragments ranges from 0 to 35 percent in the surface layer and subsoil and from 20 to 50 percent in the substratum, but the average is less than 35 percent in the control section. Reaction is strongly acid to slightly acid in the A horizon, moderately acid to neutral in the B horizon, and neutral to moderately alkaline in the C horizon.

The A horizon has hue of 2.5Y or 10YR, value of 2 to 4, and chroma of 1 or 2. It is silt loam, loam, fine sandy loam, or sandy loam in the fine earth fraction.

The Bg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2. It is silt loam, loam, fine sandy loam, or sandy loam. It is mottled.

Some pedons have a Bw horizon with hue of 5YR to 5Y, value of 3 to 5, and chroma of 2 to 4. It is sandy loam, fine sandy loam, or loam in the fine earth fraction. It is mottled.

The C horizon has hue of 5YR to 5Y, value of 3 to 5, and chroma of 2 to 4. It is loam, fine sandy loam, or sandy loam in the fine earth fraction.

Taconic Series

The Taconic series consists of shallow, somewhat excessively drained soils on bedrock-controlled uplands. The soils formed in a thin layer of loamy, acidic glacial till. Slopes range from 3 to 45 percent.

Taconic soils are mapped with well drained, moderately deep Macomber soils. Taconic soils are similar to Nassau soils, but are at an elevation of more than 1,000 feet and are in a frigid temperature regime.

Typical pedon of Taconic channery silt loam in an area of Macomber-Taconic association, steep, very rocky, in the town of Hillsdale, 500 feet east of Lockwood Road, 0.25 mile south of its intersection with West End Road:

A—0 to 6 inches; brown (10YR 4/3) channery silt loam; weak fine granular structure; friable; many fine and medium roots; 25 percent rock fragments; strongly acid; clear smooth boundary.

Bw—6 to 14 inches; yellowish brown (10YR 5/4) very channery silt loam; weak medium subangular blocky structure; friable; many fine and medium roots; few fine and medium pores; 45 percent rock fragments; strongly acid; abrupt wavy boundary.

R—14 inches; hard folded shale bedrock.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. Rock fragments are mainly shale, slate, quartz, and phyllite. Their content ranges from 10 to 35 percent in the A horizon and 30 to 60 percent in the B horizon. Unless limed, the soil is very strongly acid or strongly acid.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 2 or 3. It is silt loam or loam in the fine earth fraction.

The B horizon has hue of 7.5YR to 5Y, value of 3 to 5, and chroma of 2 to 6. It is silt loam or loam in the fine earth fraction.

Some pedons have a C horizon with hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. It is silt loam or loam in the fine earth fraction.

Udifluvents

Udifluvents consist of very deep, excessively drained to moderately well drained soils formed in alluvium recently deposited by streams. Udifluvents are on the most actively flooded areas of the flood plains along

major and secondary streams. Slopes range from 0 to 3 percent.

Udifluvents are mapped with more poorly drained Fluvaquents and are commonly near Occum, Linlithgo, and Limerick soils.

Because of scouring, cutting, lateral erosion, changing stream channels, and redeposition of sediments during frequent flooding, Udifluvents are variable in composition and properties, and no typical pedon is described.

Generally the surface layer is 3 to 15 inches thick. The depth to bedrock is more than 60 inches.

The surface layer has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 6. It is sand, loamy sand, sandy loam, silt loam, or loam and commonly the gravelly or very gravelly analogs of those textures. The content of rock fragments ranges from 0 to 50 percent. Reaction is strongly acid to mildly alkaline.

The substratum has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 6. In some pedons it is mottled. It is sandy loam, silt loam, loam, or silty clay loam or the gravelly or very gravelly analogs of those textures. It is massive. The content of rock fragments ranges from 0 to 50 percent. Reaction is strongly acid to mildly alkaline.

Udipsamments

Udipsamments consist of very deep, excessively drained to well drained soils. They formed in hydraulically dredged sediments from the Hudson River. Slopes are complex, are irregular, and range from 1 to 6 percent.

Udipsamments are commonly near Saprists and Aquents, ponded, and Fluvaquents and Udifluvents, frequently flooded. Udipsamments are sandier and better drained than Saprists and Aquents and are not subject to flooding as are Fluvaquents and Udifluvents.

Udipsamments differ from one location to another, so no typical pedon is provided.

The thickness of the sandy sediments is generally 72 inches or more. The depth to bedrock is more than 6 feet. There generally are no rock fragments. Reaction ranges from strongly acid to mildly alkaline.

Generally the surface layer is 0 to 10 inches thick. It is sand or loamy sand. Hue is 10YR, 2.5Y, or 5Y, depending on organic matter content. Value is 2 to 7, and chroma is 2 to 6.

The underlying sediments are sand and occasional lenses of loamy sand or loamy fine sand. Hue is 10YR, 2.5Y, or 5Y; value is 4 to 7; and chroma is 2 to 6.

Udorthents

Udorthents consist of very deep to shallow, excessively drained to moderately well drained soils. They are the result of cut and fill operations and contain such nonsoil material as car chassis, bricks, concrete fragments, and trees and shrubs, most of which was used to fill or build up an area for construction purposes. Most areas are near population centers or major transportation routes. Slopes range from 0 to 3 percent.

Udorthents have no soil profile development. The surface soil in areas of Udorthents generally has been transported from another area and smoothed over other deposits.

Because Udorthents differ from place to place, no typical pedon is described.

Generally the surface layer is soil material 6 to 20 inches thick. Bedrock is at a depth of at least 10 inches. The hue, value, and chroma of the surface layer varies, depending on the origin of the material. Texture ranges from sandy loam to clay. Reaction is extremely acid to moderately alkaline.

In areas where nonsoil material makes up the substratum, the composition varies from site to site. Examples are fractured slabs of concrete, car bodies, large appliances, and household garbage. Some areas are filled with tree stumps, limbs, shrubs, and similar debris.

Areas where soil material has been cut or filled for construction sites have hue of 5YR to 5Y, value of 2 to 7, and chroma of 0 to 8. The textures are very gravelly sand to clay and varying amounts of gravel, rocks, and boulders. Reaction ranges from extremely acid to moderately alkaline.

Unadilla Series

The Unadilla series consists of very deep, well drained soils on lacustrine plains. The soils formed in medium-textured, water-deposited material. Slopes range from 0 to 25 percent.

Unadilla soils are in a drainage sequence with moderately well drained Scio soils, poorly drained Raynham soils, and very poorly drained Birdsall soils. Unadilla soils do not have mottles above a depth of 24 inches; the other soils in the drainage sequence are mottled.

Typical pedon of Unadilla silt loam, 3 to 8 percent slopes, in the town of Greenport, 200 feet east of County Route 31, 0.2 mile south of its intersection with

County Route 14, 150 feet west of the powerline:

Ap—0 to 9 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; few fine roots; strongly acid; abrupt smooth boundary.
Bw1—9 to 14 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; many very fine tubular pores; strongly acid; clear smooth boundary.
Bw2—14 to 21 inches; light olive brown (2.5Y 5/6) very fine sandy loam; friable; weak coarse subangular blocky structure; friable; few fine roots; many very fine tubular pores; moderately acid; clear smooth boundary.
Bw3—21 to 28 inches; olive brown (2.5Y 4/4) very fine sandy loam; weak coarse subangular blocky structure; friable; many very fine tubular pores; moderately acid; clear smooth boundary.
C—28 to 60 inches; light olive brown (2.5Y 5/4) very fine sandy loam; common fine faint yellowish brown (10YR 5/4) mottles; massive; friable; many very fine tubular pores; moderately acid.

The thickness of the solum ranges from 20 to 50 inches. The depth to bedrock or strongly contrasting materials is more than 60 inches. Rock fragment content ranges from 0 to 5 percent throughout the soil. Reaction is very strongly acid to moderately acid in the solum and strongly acid to mildly alkaline in the C horizon. Mottles are commonly below a depth of 24 inches.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4. It is silt loam or very fine sandy loam. The Ap horizon has weak or moderate granular structure and is very friable to firm.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 6. It is silt loam or very fine sandy loam. The B horizon is massive or has weak or moderate subangular blocky or prismatic structure and is very friable to firm.

The C horizon has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 2 to 4. It is silt loam or very fine sandy loam above a depth of 40 inches and ranges from silty clay loam to very gravelly sand below 40 inches.

Vergennes Series

The Vergennes series consists of very deep, moderately well drained soils formed in very fine textured lacustrine deposits. These soils are on dissected lowlands adjacent to the Hudson River. Slopes range from 0 to 35 percent.

Vergennes soils are in an undifferentiated group with fine textured, moderately well drained Hudson soils and are in a drainage sequence with somewhat poorly drained Rhinebeck and Kingsbury soils and very poorly drained Madalin soils. Vergennes soils are not as gray or as mottled as the other soils in the sequence.

Typical pedon of Vergennes silty clay loam, in an area of Hudson and Vergennes soils, 3 to 8 percent slopes, in the town of Stuyvesant, 2,500 feet west of the intersection of Hollow Road and Eichybush Road, 200 feet south of Hollow Road:

Ap—0 to 9 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.
E—9 to 12 inches; brown (10YR 5/3) silty clay; common fine faint brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; friable; many fine and occasional medium roots; many fine vesicular pores; common fine tubular pores; some stripped sand grains on ped faces; strongly acid; abrupt smooth boundary.
B/E—12 to 15 inches; brown (10YR 4/3) clay (B part); pinkish gray (7.5YR 6/2) ped faces (E part); common fine faint strong brown (7.5YR 5/6) mottles and few fine faint light brownish gray (10YR 6/2) mottles; moderate medium and coarse subangular blocky structure; firm; some stripped sand grains on ped faces; common fine and occasional medium roots; common fine vesicular and few fine tubular pores; few patchy clay films on ped faces; very strongly acid; clear wavy boundary.
Bt—15 to 26 inches; dark brown (10YR 4/3) clay; few fine distinct light brownish gray (10YR 6/2) mottles; very coarse prismatic structure parting to strong medium subangular blocky structure; firm; thin continuous brown (10YR 5/3) clay films on ped exteriors; many fine and very fine tubular pores; common fine vesicular pores; very strongly acid; clear wavy boundary.
BC—26 to 29 inches; dark brown (10YR 4/3) clay; moderate coarse prismatic structure parting to weak thin platy; firm; occasional fine roots; common very fine tubular and vesicular pores; few vertical shrink-swell faces about 1 foot apart; slightly acid; clear smooth boundary.
C—29 to 60 inches; brown (7.5YR 5/2), yellowish brown (10YR 5/4), light gray (10YR 7/1), and reddish brown (5YR 5/3) varved clay and silty clay; strong thin and medium platy structure; occasional fine roots on shrink-swell faces; moderately alkaline;

slightly effervescent in upper 4 inches, strongly effervescent in lower part.

The thickness of the solum ranges from 14 to 40 inches. There generally are no rock fragments. Reaction ranges from very strongly acid to neutral in the solum and from neutral to moderately alkaline in the substratum. Carbonates are at a depth of 20 to 40 inches.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. It is silt loam, silty clay loam, silty clay, or clay. The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3. The Bt horizon has hue of 7.5YR to 5Y, value of 3 to 5, and chroma of 1 to 3. The C horizon has hue of 5YR to 2.5Y, value of 3 to 5, and chroma of 1 to 3. It is silt or clay in thin layers and occasional thin layers of very fine sand.

Walpole Series

The Walpole series consists of very deep, poorly drained and somewhat poorly drained soils on outwash plains. The soils formed in sandy, deltaic glaciolacustrine deposits. Slopes range from 0 to 3 percent.

Walpole soils are commonly near Castile, Hoosic, and Knickerbocker soils. Walpole soils are grayer and more mottled than excessively drained Hoosic soils, well drained Knickerbocker soils, or moderately well drained Castile soils. Walpole soils and Fredon and Halsey soils are in similar settings, but Walpole soils are sandier and do not have a skeletal substratum.

Typical pedon of Walpole sandy loam, in the town of Kinderhook, 700 feet west of Running Creek Road, and 0.3 mile north of its intersection with Maple Avenue:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) sandy loam; moderate fine granular structure; friable; small discontinuous pockets of light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/6) B material; few roots; strongly acid; abrupt smooth boundary.

Bw—11 to 20 inches; light brownish gray (2.5Y 6/2) fine sandy loam; many (45 percent) coarse prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; moderately acid; abrupt wavy boundary.

Cg1—20 to 39 inches; olive gray (5Y 5/2) loamy sand; many coarse prominent yellowish red (5YR 4/8) mottles; single grain; loose; moderately acid; diffuse wavy boundary.

Cg2—39 to 60 inches; light brownish gray (2.5Y 6/2) loamy sand; many coarse prominent olive brown (2.5Y 4/4) mottles; single grain; loose; moderately acid.

The thickness of the solum ranges from 18 to 28 inches. The content of rock fragments in the solum ranges from 0 to 25 percent, by volume, and from 0 to 50 percent in the 2C horizon, by volume. The soil ranges from very strongly acid to neutral.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The Bw horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. It is sandy loam or fine sandy loam.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It is sand or loamy sand or their gravelly analogs. The sand is dominantly of medium and coarse sizes and commonly contains thin strata ranging from fine sandy loam to gravel.

Formation of the Soils

The first part of this section describes the factors of soil formation and relates them to the formation of soils in the survey area. The second part defines the processes of soil horizon development as they relate to soil formation in Columbia County.

Factors of Soil Formation

Soil is the product of weathering and other physical and chemical processes that act on parent material. The properties of the soil at any point on the earth depend on the combination of the following factors: the physical and chemical composition of the parent material, the climate, the plant and animal life, the topography, and time. The relative influence of each of these factors of soil formation differs from place to place, and each modifies the effect of the others. For example, the effects of climate and plant and animal life are influenced by relief and by the nature of the parent material. In some places the influence of one factor is dominant. Table 20 shows the relationship between the soil series in the county and their parent material, position on the landscape, and drainage.

Parent Material

Parent material is the unconsolidated earth material in which soil forms. It determines the mineralogical and physical composition and contributes greatly to the chemical composition of the soil. It also influences the rate of the soil-forming processes.

Most of the soils in Columbia County formed in glacial deposits. Glacial till is the most extensive parent material. Less extensive are lacustrine material, glacial outwash, and some recent deposits of stream alluvium and moderately deep and deep accumulations of organic matter.

Soils formed in glacial till have a wide range of characteristics as a result of the heterogeneous mixture of rock and soil particles. A firm substratum is common in deep soils formed in glacial till. Pittstown, Bernardston, and Punsit soils, for example, formed in deep deposits of glacial till. In places the mantle of glacial till is moderately deep or shallow over shale or limestone bedrock. Manlius and Nassau soils formed over the shale, and Farmington soils formed over limestone. Macomber and Taconic soils, at an elevation of more than 1,000 feet, formed in till over shale bedrock.

As the glacial ice melted, enormous quantities of meltwater carried and sorted soil and rock debris. This outwash material was redeposited in layers of sand and gravel on outwash plains, terraces, and eskers. Examples of soils formed in this material are Blasdell and Hoosic soils. These soils commonly are medium textured to coarse textured.

Many of the larger valleys at one time contained glacial lakes where glacial meltwater was impounded. Most of the stone-free sediment deposited in the still lake waters was clayey or silty. Kingsbury, Hudson, and Livington soils are examples of soils that formed in these fine textured deposits.

In more recent times, overflowing streams have deposited fresh, dark alluvial material on flood plains. Soils formed in this material are typically silty or loamy and show weak soil profile development. Occum and Linlithgo soils are examples.

Soils formed in organic deposits in low areas are identified as muck. Carlisle and Palms soils, for example, formed in well decomposed remains of trees and other plants.

Topography

The shape of the land surface, the slope, and the position of the land surface as related to the water table have had great influence on the formation of soil.

Soils that formed in convex, sloping areas where little runoff accumulates or where runoff is medium or rapid are generally well drained and have a bright, unmottled subsoil. They are generally leached to a greater depth than are low-lying wetter soils in the same general area.

In more gently sloping areas where runoff is slower, some wetness is evidenced by mottling in the subsoil.

In level areas or slight depressions where the water table is at or near the surface for long periods, a marked degree of wetness is evidenced by a thick, dark surface layer and a strongly mottled or gray subsoil.

Climate

Climate, particularly temperature and precipitation, determines to a large degree the kind of weathering processes that occur. It also affects the growth and kind of vegetation and the leaching and translocation of weathered materials.

Columbia County has a humid, temperate climate that promotes the development of moderately weathered, leached soils. The difference in elevation between most of the county, which is in the Hudson Valley, and the easternmost part of the county, which is on the Taconic Mountains, results in two soil temperature regimes, mesic and frigid. The cutoff between the mesic and frigid temperature regimes is 1,000 feet above sea level. Cooler temperatures tend to slow down the weathering processes and shorten the growing season. More detailed and specific data on the climate of Columbia County are in the climate section under "General Nature of the County."

Plant and Animal Life

All living organisms, including plants, animals, bacteria, and fungi, influence soil formation. Vegetation is generally responsible for the amount of organic matter and nutrients in the soil and for the color and structure of the surface layer. Earthworms and other burrowing animals help to keep the soil porous and more permeable to air and water. Their waste products cause aggregations of soil particles and improve soil structure. Bacteria and fungi decompose vegetation, a process which results in the release of nutrients.

This survey area was originally a forest of northern hardwoods and pines. The loss of nutrients through leaching is slow under hardwoods because they take up large quantities of bases (nutrients) and return much of them to the soil each year as leaf litter. Conifers, such as pines, do not use large amounts of nutrients; therefore, leaching is more rapid under conifers than it is under hardwoods.

Because the rooting depth is shallow in many of the upland soils, trees are susceptible to windthrow, which has caused much mixing of the soil material.

Man, through clearing of trees and cultivation of the land, has also influenced changes that occur in soils. He has added nutrients by fertilizing, has mixed some soil horizons by plowing, and has accelerated erosion in many areas.

Time

The degree of profile development not only reflects the age of a soil but also reflects the influence of other factors. In geological terms, the parent material of the soils in the survey area is relatively young, having been deposited when the last glacier receded about 10,000 to 15,000 years ago. The different soils have reached different stages of development because the other soil-forming factors also influence the rate of development. Hudson soils, for example, are developed to a depth of about 24 inches, while Stockbridge soils are developed to a depth of 36 inches. Though the time of the development is the same, the soils are different in appearance and depth of the weathering because of differences in the parent material of each soil.

An immature soil is one that has not had enough time to develop distinct horizons. The Linlithgo and Limerick soils are examples. They formed in recent alluvium on flood plains subject to periodic deposition and erosion, which interrupt soil development and result in a thin or irregular soil profile.

Processes of Soil Formation

This section provides an explanation of soil horizon nomenclature and a description of the processes involved in soil horizon development as they relate to soil formation.

Soil forms in different layers, or horizons. These horizons can be viewed in a vertical cut of soil, known as a soil profile. The soil profile extends from the surface downward into material that is little altered by the soil-forming processes. Most soils contain three major horizons, called A, B, and C horizons. Several processes cause the formation of those horizons: the accumulation of organic matter, the leaching of soluble salts and minerals, the translocation of clay minerals, the reduction and transfer of iron, and the formation of dense and compact layers in the subsoil *(7)*.

The accumulation of organic matter takes place as plant residue decomposes. This process darkens the surface layer and helps to form the A1 horizon. It takes a long time to replace this organic matter once it has been lost. The organic matter content of the surface layer of soils in the survey area averages about 4 percent.

For soils to develop a distinct subsoil, some of the lime and other soluble salts must be leached before other processes, such as translocation of clay minerals can take place. Some of the factors that affect leaching are the kinds of salts originally present, the rate and depth of percolation, and the texture of the soil.

One of the major processes of horizon development in some of the soils is the translocation of silicate clay minerals. The amount of clay minerals is inherent in the parent material, but clay content varies from one soil horizon to another. Clay particles are transported (eluviation) downward from the A horizon and redeposited (illuviation) in the B horizon as clay films on ped faces, as linings along pores and root channels, and as coatings on some coarse fragments. In some soils an A2 horizon has formed by considerable eluviation of clay minerals to the B horizon. The Collamer soil is an example of a soil where the clay content is higher in the B horizon than in the A horizon because of translocation.

The reduction and transfer of iron compounds occur mainly in the more poorly drained soils. This process is known as gleying. In poorly drained and very poorly drained soils, such as Halsey and Canandaigua soils, the grayish subsoil indicates the reduction of iron. In moderately well drained and somewhat poorly drained soils, such as Elnora and Castile soils, yellowish brown and reddish brown mottles indicate the segregation of iron compounds. A bright-colored, unmottled subsoil indicates a well drained soil where no reduction and transfer of iron have taken place. Knickerbocker soils are an example.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently

sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds just beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Congeliturbate. Soil material disturbed by frost action.

Conservation tillage. A tillage and planting system in which crop residue covers at least 30 percent of the soil surface after planting. Where soil erosion

by wind is the main concern, the system leaves the equivalent of at least 1,000 pounds per acre of flat small-grain residue on the surface during the critical erosion period.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat

poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of Vertisols—clayey soils having a high coefficient of expansion and contraction with changes in moisture content.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting ground ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an

association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are—

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables.) Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the substratum. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay

(0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are—

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates

longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded

glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1957-81 at Hudson, NY)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	32.8	12.9	22.9	57	-16	11	2.93	1.16	4.41	5	9.7
February----	35.9	14.9	25.4	57	-15	10	2.64	1.19	3.87	5	8.5
March-------	46.5	24.5	35.5	73	1	44	2.71	1.39	3.85	5	7.7
April-------	61.4	34.6	48.0	87	18	252	3.01	1.89	4.01	6	.8
May---------	73.0	45.2	59.1	94	28	592	3.48	1.57	5.11	7	.0
June--------	80.9	54.7	67.8	96	37	834	3.66	2.00	5.11	7	.0
July--------	85.2	59.6	72.4	98	44	1,004	3.57	1.78	5.12	7	.0
August------	82.7	58.2	70.5	95	42	946	3.34	2.03	4.50	7	.0
September---	75.2	51.1	63.2	92	31	696	3.95	2.06	5.60	7	.0
October-----	63.3	40.0	51.7	82	20	368	3.11	1.50	4.50	5	.0
November----	50.3	32.0	41.2	72	13	109	3.33	1.87	4.62	7	1.4
December----	37.1	20.0	28.6	60	- 7	14	3.53	1.67	5.12	7	14.1
Yearly:											
Average---	60.4	37.3	48.9	---	---	---	---	---	---	---	---
Extreme---	---	---	---	99	-19	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,880	39.26	31.71	46.64	75	42.2

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1957-81 at Hudson, NY)

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 26	May 10	May 21
2 years in 10 later than--	Apr. 22	May 5	May 17
5 years in 10 later than--	Apr. 14	Apr. 25	May 9
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 12	Oct. 2	Sept. 21
2 years in 10 earlier than--	Oct. 18	Oct. 7	Sept. 26
5 years in 10 earlier than--	Oct. 29	Oct. 17	Oct. 6

TABLE 3.--GROWING SEASON

(Recorded in the period 1957-81 at Hudson, NY)

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	176	151	132
8 years in 10	184	159	138
5 years in 10	198	174	150
2 years in 10	212	190	161
1 year in 10	219	198	167

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Ad	Alden mucky silt loam	2,215	0.5
Au	Aurelie silt loam	846	0.2
BeB	Bernardston silt loam, 3 to 8 percent slopes	790	0.2
BeC	Bernardston silt loam, 8 to 15 percent slopes	4,223	1.0
BeD	Bernardston silt loam, 15 to 25 percent slopes	2,262	0.5
BeE	Bernardston silt loam, 25 to 35 percent slopes	982	0.2
Bh	Birdsall silt loam	2,269	0.6
BlA	Blasdell channery loam, 0 to 3 percent slopes	7,146	1.7
BlB	Blasdell channery loam, 3 to 8 percent slopes	5,673	1.4
BlC	Blasdell channery loam, rolling	6,335	1.5
BlD	Blasdell channery loam, hilly	2,606	0.6
BmA	Blasdell channery silt loam, fan, 0 to 3 percent slopes	1,956	0.5
BmB	Blasdell channery silt loam, fan, 3 to 8 percent slopes	2,217	0.5
Ca	Canandaigua silt loam	3,699	0.9
Cc	Carlisle muck	3,812	0.9
Ce	Castile gravelly silt loam	1,134	0.3
CnB	Cazenovia silt loam, 3 to 8 percent slopes	1,862	0.5
CnC	Cazenovia silt loam, 8 to 15 percent slopes	1,988	0.5
CnD	Cazenovia silt loam, 15 to 25 percent slopes	788	0.2
CoA	Collamer silt loam, 0 to 3 percent slopes	570	0.1
CoB	Collamer silt loam, 3 to 8 percent slopes	2,557	0.6
CoC	Collamer silt loam, 8 to 15 percent slopes	751	0.2
ElA	Elmridge very fine sandy loam, 0 to 3 percent slopes	530	0.1
ElB	Elmridge very fine sandy loam, 3 to 8 percent slopes	304	0.1
En	Elnora fine sandy loam	477	0.1
FaB	Farmington silt loam, undulating, very rocky	833	0.2
FaC	Farmington silt loam, rolling, very rocky	3,641	0.9
FaD	Farmington silt loam, hilly, very rocky	3,264	0.8
FdE	Farmington-Rock outcrop complex, steep	616	0.1
Fn	Fluvaquents-Udifluvents complex, frequently flooded	6,267	1.5
Fr	Fredon silt loam	1,847	0.4
GaA	Georgia silt loam, 0 to 3 percent slopes	271	0.1
GaB	Georgia silt loam, 3 to 8 percent slopes	3,777	0.9
GaC	Georgia silt loam, 8 to 15 percent slopes	4,904	1.2
Ha	Halsey mucky silt loam	1,668	0.4
HoA	Hoosic gravelly sandy loam, 0 to 3 percent slopes	5,692	1.4
HoB	Hoosic gravelly sandy loam, 3 to 8 percent slopes	3,446	0.8
HoC	Hoosic gravelly sandy loam, rolling	4,216	1.0
HoD	Hoosic gravelly sandy loam, hilly	1,132	0.3
HpE	Hoosic and Blasdell soils, steep	2,419	0.6
HvA	Hudson and Vergennes soils, 0 to 3 percent slopes	584	0.1
HvB	Hudson and Vergennes soils, 3 to 8 percent slopes	4,202	1.0
HvC	Hudson and Vergennes soils, 8 to 15 percent slopes	1,243	0.3
HvD	Hudson and Vergennes soils, hilly	4,561	1.1
HvE	Hudson and Vergennes soils, steep	4,063	1.0
KnA	Kingsbury and Rhinebeck soils, 0 to 3 percent slopes	5,329	1.3
KnB	Kingsbury and Rhinebeck soils, 3 to 8 percent slopes	1,905	0.5
KrA	Knickerbocker fine sandy loam, 0 to 3 percent slopes	7,710	1.9
KrB	Knickerbocker fine sandy loam, 3 to 8 percent slopes	2,492	0.6
KrC	Knickerbocker fine sandy loam, rolling	1,248	0.3
KrD	Knickerbocker fine sandy loam, hilly	584	0.1
LaE	Lanesboro channery silt loam, steep, stony	4,231	1.0
LaF	Lanesboro channery silt loam, very steep, stony	503	0.1
LmC	Lanesboro-Monarda association, strongly sloping, very stony	7,910	1.9
Ln	Limerick silt loam	5,371	1.3
Lo	Linlithgo silt loam	3,859	0.9
Lt	Livingston and Madalin soils	1,471	0.4
MaC	Macomber-Taconic association, strongly sloping, rocky	8,126	2.0
MbE	Macomber-Taconic association, steep, very rocky	21,362	5.2
MnA	Manlius channery silt loam, 0 to 3 percent slopes	246	0.1
MnB	Manlius channery silt loam, 3 to 8 percent slopes	6,002	1.5
MnC	Manlius channery silt loam, 8 to 15 percent slopes	7,002	1.7
MnD	Manlius channery silt loam, 15 to 25 percent slopes	3,230	0.8
MsA	Massena silt loam, 0 to 3 percent slopes	834	0.2

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
MsB	Massena silt loam, 3 to 8 percent slopes	2,297	0.6
NaB	Nassau channery silt loam, undulating, rocky	8,025	2.0
NbC	Nassau channery silt loam, rolling, very rocky	42,978	10.4
NbD	Nassau channery silt loam, hilly, very rocky	40,910	9.9
NbE	Nassau channery silt loam, steep, very rocky	10,155	2.5
NgA	Niagara silt loam, 0 to 3 percent slopes	3,121	0.8
NgB	Niagara silt loam, 3 to 8 percent slopes	258	0.1
Om	Occum loam	4,164	1.0
OvA	Ovid silt loam, 0 to 3 percent slopes	164	*
OvB	Ovid silt loam, 3 to 8 percent slopes	336	0.1
Pa	Palms muck	2,617	0.6
Pr	Pits, quarry	376	0.1
Ps	Pits, sand and gravel	842	0.2
PtB	Pittstown silt loam, 3 to 8 percent slopes	3,177	0.8
PtC	Pittstown silt loam, 8 to 15 percent slopes	5,646	1.4
PtD	Pittstown silt loam, 15 to 25 percent slopes	1,906	0.5
PuA	Punsit silt loam, 0 to 3 percent slopes	483	0.1
PuB	Punsit silt loam, 3 to 8 percent slopes	2,267	0.6
PuC	Punsit silt loam, 8 to 15 percent slopes	1,036	0.3
Ra	Raynham very fine sandy loam	4,673	1.1
Sa	Saprists and Aquents, ponded	1,101	0.3
ScA	Scio silt loam, 0 to 3 percent slopes	1,900	0.5
ScB	Scio silt loam, 3 to 8 percent slopes	1,043	0.3
Sh	Shaker loam	339	0.1
StB	Stockbridge silt loam, 3 to 8 percent slopes	4,682	1.1
StC	Stockbridge silt loam, 8 to 15 percent slopes	16,768	4.1
StD	Stockbridge silt loam, 15 to 25 percent slopes	9,780	2.4
StE	Stockbridge silt loam, 25 to 35 percent slopes	3,208	0.8
SuB	Stockbridge-Farmington silt loams, undulating	713	0.2
SuC	Stockbridge-Farmington silt loams, rolling	5,272	1.3
SvD	Stockbridge-Farmington silt loams, hilly, very rocky	2,441	0.6
Sw	Sun silt loam	4,276	1.0
TmF	Taconic-Macomber association, very steep, very rocky	9,466	2.3
Ud	Udipsamments, dredged	363	0.1
Ue	Udorthents, smoothed	2,395	0.6
UnA	Unadilla silt loam, 0 to 3 percent slopes	398	0.1
UnB	Unadilla silt loam, 3 to 8 percent slopes	957	0.2
UnC	Unadilla silt loam, 8 to 15 percent slopes	472	0.1
UnD	Unadilla silt loam, 15 to 25 percent slopes	608	0.1
UrB	Urban land-Hudson-Vergennes complex, undulating	317	0.1
Wa	Walpole sandy loam	1,430	0.3
	Water	2,107	0.5
	Total	411,520	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
BeB	Bernardston silt loam, 3 to 8 percent slopes
BlA	Blasdell channery loam, 0 to 3 percent slopes
BlB	Blasdell channery loam, 3 to 8 percent slopes
BmA	Blasdell channery silt loam, 0 to 3 percent slopes, fan
BmB	Blasdell channery silt loam, 3 to 8 percent slopes, fan
Ce	Castile gravelly silt loam
CoA	Collamer silt loam, 0 to 3 percent slopes
ElA	Elmridge very fine sandy loam, 0 to 3 percent slopes
ElB	Elmridge very fine sandy loam, 3 to 8 percent slopes
En	Elnora fine sandy loam
Fr	Fredon silt loam (where drained)
GaA	Georgia silt loam, 0 to 3 percent slopes
GaB	Georgia silt loam, 3 to 8 percent slopes
KrA	Knickerbocker fine sandy loam, 0 to 3 percent slopes
KrB	Knickerbocker fine sandy loam, 3 to 8 percent slopes
Lo	Linlithgo silt loam (where drained)
MsA	Massena silt loam, 0 to 3 percent slopes (where drained)
MsB	Massena silt loam, 3 to 8 percent slopes (where drained)
NgA	Niagara silt loam, 0 to 3 percent slopes (where drained)
Om	Occum loam
OvA	Ovid silt loam, 0 to 3 percent slopes (where drained)
PtB	Pittstown silt loam, 3 to 8 percent slopes
Ra	Raynham very fine sandy loam (where drained)
ScA	Scio silt loam, 0 to 3 percent slopes
Sh	Shaker loam (where drained)
StB	Stockbridge silt loam, 3 to 8 percent slopes
UnA	Unadilla silt loam, 0 to 3 percent slopes
Wa	Walpole sandy loam (where drained)

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Corn silage	Oats	Trefoil-grass hay	Grass-legume hay	Wheat	Pasture
		Bu	Tons	Bu	Tons	Tons	Bu	AUM*
Ad---------- Alden	IVw	---	---	---	---	2.0	---	---
Au---------- Aurelie	IVw	---	---	---	---	---	---	---
BeB---------- Bernardston	IIe	120	20	80	---	4.0	50	---
BeC---------- Bernardston	IIIe	100	16	75	---	3.5	45	---
BeD---------- Bernardston	IVe	---	---	---	---	3.0	---	---
BeE---------- Bernardston	VIe	---	---	---	---	---	---	---
Bh---------- Birdsall	Vw	---	---	---	---	2.0	---	---
BlA---------- Blasdell	IIs	100	20	80	---	5.0	50	6.5
BlB---------- Blasdell	IIs	100	20	80	---	5.0	50	6.5
BlC---------- Blasdell	IIIe	90	18	75	---	4.5	45	6.5
BlD---------- Blasdell	IVe	---	---	---	---	4.0	---	6.0
BmA---------- Blasdell	IIs	100	20	80	---	5.0	50	6.5
BmB---------- Blasdell	IIe	100	20	80	---	5.0	50	6.5
Ca---------- Canandaigua	Vw	---	---	---	---	---	---	---
Cc---------- Carlisle	Vw	---	---	---	---	---	---	---
Ce---------- Castile	IIw	120	23	90	---	4.0	50	7.5
CnB---------- Cazenovia	IIe	120	24	95	---	5.0	50	8.5
CnC---------- Cazenovia	IIIe	110	22	90	5.0	5.0	45	7.5
CnD---------- Cazenovia	IVe	---	---	---	---	4.0	---	6.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Oats	Trefoil-grass hay	Grass-legume hay	Wheat	Pasture
		Bu	Tons	Bu	Tons	Tons	Bu	AUM*
CoA---------- Collamer	IIw	110	22	65	3.5	2.5	---	---
CoB---------- Collamer	IIe	110	22	65	3.5	2.5	---	---
CoC---------- Collamer	IIIe	90	18	60	3.5	2.5	---	---
ElA---------- Elmridge	IIw	100	20	65	4.0	4.0	---	7.6
ElB---------- Elmridge	IIw	100	20	65	4.0	4.0	---	7.6
En---------- Elnora	IIIw	100	20	65	4.0	3.5	---	6.5
FaB---------- Farmington	VIs	---	---	---	---	3.5	---	5.5
FaC---------- Farmington	VIs	---	---	---	---	3.0	---	4.5
FaD---------- Farmington	VIs	---	---	---	---	2.5	---	4.0
FdE**---------- Farmington-Rock outcrop	VIIs	---	---	---	---	---	---	---
Fn---------- Fluvaquents-Udifluvents	Vw	---	---	---	---	---	---	---
Fr---------- Fredon	IIIw	80	16	---	3.0	---	---	5.7
GaA---------- Georgia	IIw	120	23	75	---	4.0	55	---
GaB---------- Georgia	IIe	120	23	75	---	4.0	55	---
GaC---------- Georgia	IIIe	115	21	70	---	4.0	50	---
Ha---------- Halsey	Vw	---	---	---	---	---	---	---
HoA---------- Hoosic	IIIs	60	12	50	---	3.5	40	7.5
HoB---------- Hoosic	IIIs	60	12	50	---	3.5	40	7.5
HoC---------- Hoosic	IIIe	50	10	45	---	3.0	35	7.5
HoD---------- Hoosic	IVe	---	---	---	---	2.5	---	6.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Oats	Trefoil-grass hay	Grass-legume hay	Wheat	Pasture
		Bu	Tons	Bu	Tons	Tons	Bu	AUM*
HpE---------- Hoosic and Blasdell	VIe	---	---	---	---	---	---	---
HvA---------- Hudson and Vergennes	IIw	80	16	60	3.5	3.5	---	---
HvB---------- Hudson and Vergennes	IIe	80	16	60	3.5	3.5	---	---
HvC---------- Hudson and Vergennes	IIIe	70	15	50	3.5	3.5	---	---
HvD---------- Hudson and Vergennes	IVe	---	---	---	---	---	---	---
HvE---------- Hudson and Vergennes	VIe	---	---	---	---	---	---	---
KnA---------- Kingsbury and Rhinebeck	IIIw	75	14	50	3.0	3.0	---	5.8
KnB---------- Kingsbury and Rhinebeck	IIIw	75	14	50	3.0	3.0	---	5.8
KrA---------- Knickerbocker	IIs	100	20	80	---	3.0	50	7.5
KrB---------- Knickerbocker	IIIs	100	20	80	---	3.0	50	7.5
KrC---------- Knickerbocker	IIIe	90	18	75	---	3.0	45	7.5
KrD---------- Knickerbocker	IVe	---	---	---	---	2.5	---	6.5
LaE---------- Lanesboro	VIs	---	---	---	---	---	---	---
LaF---------- Lanesboro	VIIs	---	---	---	---	---	---	---
LmC**---------- Lanesboro-Monarda	VIIs	---	---	---	---	---	---	---
Ln---------- Limerick	IIIw	---	---	---	---	---	---	---
Lo---------- Linlithgo	IIIw	130	25	---	3.5	5.0	---	8.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Oats	Trefoil-grass hay	Grass-legume hay	Wheat	Pasture
		Bu	Tons	Bu	Tons	Tons	Bu	AUM*
Lt---------- Livingston and Madalin	IVw	---	---	---	---	---	---	---
MaC**:								
Macomber-------	IVe	---	---	---	---	---	---	6.0
Taconic--------	IVe	---	---	---	---	---	---	4.0
MbE**:								
Macomber-------	VIIe	---	---	---	---	---	---	4.0
Taconic--------	VIIe	---	---	---	---	---	---	---
MnA---------- Manlius	IIs	100	20	80	---	4.0	50	6.5
MnB---------- Manlius	IIe	100	20	80	---	4.0	50	6.5
MnC---------- Manlius	IIIe	90	18	75	---	4.0	45	6.5
MnD---------- Manlius	IVe	---	---	---	---	2.5	---	6.0
MsA, MsB-------- Massena	IIIw	90	18	---	---	3.0	---	6.5
NaB---------- Nassau	IIIe	50	10	50	---	3.0	40	5.5
NbC---------- Nassau	VIs	---	---	---	---	2.5	---	4.5
NbD---------- Nassau	VIs	---	---	---	---	---	---	4.0
NbE---------- Nassau	VIIs	---	---	---	---	---	---	---
NgA---------- Niagara	IIIw	80	16	40	3.0	3.5	---	6.5
NgB---------- Niagara	IIIw	80	16	40	3.0	3.5	---	6.5
Om---------- Occum	I	135	30	100	---	6.0	---	---
OvA---------- Ovid	IIIw	90	18	---	3.0	---	---	7.5
OvB---------- Ovid	IIIw	90	18	---	3.0	---	---	7.5
Pa---------- Palms	Vw	---	---	---	---	---	---	---
Pr**, Ps**. Pits								

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Oats	Trefoil-grass hay	Grass-legume hay	Wheat	Pasture
		Bu	Tons	Bu	Tons	Tons	Bu	AUM*
PtB---------- Pittstown	IIe	110	20	70	---	3.5	45	---
PtC---------- Pittstown	IIIe	100	18	65	---	3.5	40	---
PtD---------- Pittstown	IVe	---	---	---	---	3.0	---	---
PuA---------- Punsit	IIIw	80	16	45	3.0	3.0	---	5.5
PuB---------- Punsit	IIIw	80	16	45	3.0	3.0	---	5.5
PuC---------- Punsit	IIIe	---	14	---	---	3.0	---	5.5
Ra---------- Raynham	IIIw	80	16	40	3.0	---	---	---
Sa---------- Saprists and Aquents	Vw	---	---	---	---	---	---	---
ScA---------- Scio	IIw	110	22	65	3.0	3.5	45	8.5
ScB---------- Scio	IIe	110	22	65	3.0	3.5	45	8.5
Sh---------- Shaker	IIIw	80	18	40	---	3.5	---	6.6
StB---------- Stockbridge	IIe	125	24	80	---	5.5	60	---
StC---------- Stockbridge	IIIe	120	22	80	---	5.5	60	---
StD---------- Stockbridge	IVe	---	20	---	---	5.0	---	---
StE---------- Stockbridge	VIe	---	---	---	---	---	---	---
SuB---------- Stockbridge-Farmington	IIIe	---	20	---	---	4.0	---	---
SuC---------- Stockbridge-Farmington	IVe	---	---	---	---	3.9	---	---
SvD---------- Stockbridge-Farmington	VIs	---	---	---	---	---	---	---
Sw---------- Sun	IVw	---	---	---	2.5	---	---	5.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Oats	Trefoil-grass hay	Grass-legume hay	Wheat	Pasture
		Bu	Tons	Bu	Tons	Tons	Bu	AUM*
TmF**:								
Taconic	VIIs	---	---	---	---	---	---	---
Macomber	VIIs	---	---	---	---	---	---	---
Ud**. Udipsamments								
Ue**. Orthents								
UnA Unadilla	I	125	24	80	---	5.5	60	6.5
UnB Unadilla	IIe	125	24	80	---	5.5	60	6.5
UnC Unadilla	IIIe	110	22	70	---	4.5	50	6.5
UnD Unadilla	IVe	---	---	---	---	4.0	---	6.0
UrB. Urban land-Hudson-Vergennes								
Wa Walpole	IIIw	---	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	4,562	---	---	---
II	55,518	27,489	5,298	22,731
III	110,018	63,398	34,990	11,630
IV	54,607	45,799	8,808	---
V	21,433	---	21,433	---
VI	108,970	10,672	---	98,298
VII	50,012	21,362	---	28,650
VIII	---	---	---	---

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Absence of an entry indicates that information was not available. Most site index data are estimates; plot data were available only for red oak on Bernardston soils)

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
Ad---------- Alden	2W	Slight	Severe	Severe	Severe	Red maple----------	50	2	
Au---------- Aurelie	1W	Slight	Severe	Moderate	Severe	Red maple----------	40	1	
BeB, BeC-------- Bernardston	4A	Slight	Slight	Slight	Slight	Northern red oak----	72	4	Eastern white pine, red pine, European larch.
						Eastern white pine--	65	8	
						Sugar maple---------	65	3	
						Eastern hemlock-----	---	---	
						Red maple----------	---	---	
						White ash----------	---	---	
BeD, BeE-------- Bernardston	4R	Slight	Moderate	Slight	Slight	Northern red oak----	72	4	Eastern white pine, red pine, European larch.
						Eastern white pine--	65	8	
						Sugar maple---------	65	3	
						Red maple----------	60	---	
						White ash----------	70	---	
Bh---------- Birdsall	2W	Slight	Severe	Severe	Severe	Red maple----------	50	2	
BlA, BlB, BlC--- Blasdell	4A	Slight	Slight	Slight	Slight	Northern red oak----	70	4	Eastern white pine, red pine, European larch, black locust.
						Sugar maple---------	80	4	
BlD---------- Blasdell	4R	Slight	Moderate	Slight	Slight	Northern red oak----	70	4	Eastern white pine, red pine, European larch.
						Sugar maple---------	80	4	
BmA, BmB-------- Blasdell	4A	Slight	Slight	Slight	Slight	Northern red oak----	70	4	Eastern white pine, red pine, European larch.
						Sugar maple---------	80	4	
Ca---------- Canandaigua	3W	Slight	Severe	Severe	Severe	Red maple----------	50	2	
						Eastern hemlock-----	---	---	
Cc---------- Carlisle	2W	Slight	Severe	Severe	Severe	Swamp white oak-----	56	2	
						White ash----------	---	---	
						Green ash----------	---	---	
						Quaking aspen-------	---	---	
						Red maple----------	---	---	
Ce---------- Castile	3A	Slight	Slight	Slight	Slight	Sugar maple---------	63	3	Eastern white pine, Norway spruce, red pine.
						Northern red oak----	70	4	
						Black cherry--------	70	3	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
CnB, CnC-------- Cazenovia	3A	Slight	Slight	Slight	Slight	Sugar maple--------- Northern red oak---- Yellow-poplar--------	70 80 85	3 4 6	Norway spruce, white spruce, eastern white pine, yellow-poplar, European larch.
CnD-------------- Cazenovia	3R	Moderate	Moderate	Slight	Slight	Sugar maple--------- Northern red oak---- Yellow-poplar--------	70 80 85	3 4 6	Norway spruce, white spruce, eastern white pine, yellow-poplar, European larch.
CoA, CoB-------- Collamer	3A	Slight	Slight	Slight	Slight	Sugar maple--------- White ash----------- Northern red oak---- American basswood--- Black cherry--------	70 85 80 80 75	3 4 4 4 3	Eastern white pine, Norway spruce, white spruce, European larch, red pine.
CoC-------------- Collamer	3R	Moderate	Slight	Slight	Slight	Sugar maple--------- White ash----------- Northern red oak---- American basswood--- Black cherry--------	70 85 80 80 75	3 4 4 4 3	Eastern white pine, Norway spruce, white spruce, European larch, red pine.
ElA, ElB-------- Elmridge	10A	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Shagbark hickory---- White oak-----------	75 70 60 70	10 4 --- ---	Eastern white pine, Norway spruce, white spruce.
En--------------- Elnora	4S	Slight	Slight	Severe	Slight	Northern red oak---- Eastern white pine-- Sugar maple---------	70 75 60	4 8 2	Eastern white pine, red pine.
FaB, FaC-------- Farmington	2D	Slight	Slight	Severe	Moderate	Sugar maple--------- Northern red oak---- Eastern white pine-- American basswood--- White ash----------- Eastern hemlock-----	50 50 55 55 55 ---	2 2 6 2 2 ---	
FaD-------------- Farmington	2D	Moderate	Moderate	Severe	Moderate	Sugar maple--------- Northern red oak---- Eastern white pine-- American basswood--- White ash----------- Eastern hemlock-----	50 50 55 55 55 ---	2 2 6 2 2 ---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
FdE**:									
Farmington-----	2D	Moderate	Moderate	Severe	Moderate	Sugar maple---------	50	2	
						Northern red oak----	50	2	
						Eastern white pine--	55	6	
						American basswood---	55	2	
						White ash-----------	55	2	
						Eastern hemlock-----	---	---	
Rock outcrop.									
Fr----------	3W	Slight	Severe	Severe	Severe	Northern red oak----	60	3	
Fredon						Eastern white pine--	70	5	
						Red maple-----------	70	9	
GaA, GaB, GaC---	3A	Slight	Slight	Slight	Slight	Sugar maple---------	60	3	Eastern white pine, larch, Norway spruce, red pine.
Georgia						Northern red oak----	70	4	
						Red maple-----------	70	3	
						White ash-----------	66	3	
						Eastern white pine--	75	10	
						Basswood------------	65	3	
						Quaking aspen-------	---	---	
Ha----------	2W	Slight	Severe	Severe	Severe	Red maple-----------	55	2	
Halsey						White oak-----------	---	--	
						Swamp white oak-----	---	--	
						American beech------	---	--	
						River birch---------	---	--	
HoA, HoB, HoC---	4A	Slight	Slight	Slight	Slight	Northern red oak----	75	3	Eastern white pine, red pine, black locust.
Hoosic						Sugar maple---------	65	4	
						White pine----------	75	10	
HoD----------	4R	Slight	Moderate	Slight	Slight	Sugar maple---------	65	3	Eastern white pine, red pine, black locust.
Hoosic						Northern red oak----	75	4	
						White pine----------	---	---	
HpE**:									
Hoosic---------	4R	Slight	Moderate	Slight	Slight	Sugar maple---------	65	3	Eastern white pine, red pine, black locust.
						Northern red oak----	75	4	
						White pine----------	---	---	
Blasdell-------	3R	Slight	Moderate	Slight	Slight	Sugar maple---------	70	3	Eastern white pine, red pine, European larch.
						Northern red oak----	80	4	
HvA**, HvB**:									
Hudson---------	4A	Slight	Slight	Slight	Slight	Northern red oak----	70	4	Eastern white pine, Norway spruce, white spruce.
						Sugar maple---------	60	3	
						Eastern white pine--	75	10	
						White ash-----------	75	4	
Vergennes------	8C	Slight	Moderate	Severe	Slight	Eastern white pine--	65	8	Eastern white pine, Norway spruce, white spruce.
						Northern red oak----	58	3	
						Sugar maple---------	60	3	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
HvC**:									
Hudson	4R	Moderate	Slight	Slight	Slight	Northern red oak	70	4	Eastern white pine, Norway spruce, white spruce.
						Sugar maple	60	3	
						Eastern white pine	75	10	
						White ash	75	4	
Vergennes	8C	Slight	Moderate	Severe	Slight	Eastern white pine	65	8	Eastern white pine, Norway spruce.
						Northern red oak	58	3	
						Sugar maple	60	3	
HvD**, HvE**:									
Hudson	4R	Severe	Moderate	Slight	Slight	Northern red oak	70	4	Eastern white pine, Norway spruce, white spruce.
						Sugar maple	60	3	
						Eastern white pine	75	10	
						White ash	75	4	
Vergennes	8R	Moderate	Severe	Severe	Slight	Eastern white pine	65	8	Eastern white pine, Norway spruce.
						Northern red oak	58	3	
						Sugar maple	60	3	
KnA**, KnB**:									
Kingsbury	3W	Slight	Moderate	Slight	Moderate	Sugar maple	60	3	Eastern white pine, Norway spruce, white spruce.
						Northern red oak	70	8	
						Eastern white pine	75	10	
						White ash	67	3	
						Red maple	60	---	
Rhinebeck	3W	Slight	Moderate	Slight	Slight	Sugar maple	60	3	Eastern white pine, Norway spruce, white spruce.
						Northern red oak	70	4	
						Eastern white pine	75	10	
						Red maple	60	3	
KrA, KrB, KrC---Knickerbocker	3A	Slight	Slight	Slight	Slight	Sugar maple	65	3	Eastern white pine, red pine, European larch.
						Northern red oak	75	4	
						White pine	80	---	
KrD---Knickerbocker	3A	Slight	Moderate	Slight	Slight	Sugar maple	65	3	Eastern white pine, red pine, European larch.
						Northern red oak	75	4	
						White pine	80	---	
LaE---Lanesboro	3R	Moderate	Moderate	Slight	Slight	Northern red oak	55	3	Eastern white pine, eastern hemlock, Norway spruce, white spruce.
						Eastern white pine	65	8	
						Sugar maple	65	3	
						Eastern hemlock	65	---	
						Red maple	65	---	
						White ash	70	---	
LaF---Lanesboro	3R	Severe	Severe	Slight	Slight	Northern red oak	55	3	
						Eastern white pine	65	8	
						Sugar maple	65	3	
						Eastern hemlock	---	---	
						White ash	70	3	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
LmC**:									
Lanesboro------	3A	Slight	Slight	Slight	Slight	Northern red oak----	55	3	Eastern white pine, eastern hemlock, Norway spruce, white spruce.
						Eastern white pine--	65	8	
						Sugar maple---------	65	3	
						Eastern hemlock-----	---	---	
						Red maple-----------	65	3	
						White ash-----------	70	3	
Monarda--------	8W	Slight	Severe	Moderate	Severe	Eastern white pine--	66	8	Eastern white pine, white spruce, Norway spruce.
						Sugar maple---------	55	2	
						Paper birch---------	60	4	
						Red oak-------------	55	3	
						Red maple-----------	---	---	
						Quacking aspen------	---	---	
						White ash-----------	---	3	
Ln-------------- Limerick	2W	Slight	Severe	Severe	Severe	Red maple-----------	40	2	Eastern white pine, white spruce, Norway spruce.
						Eastern white pine--	65	8	
						Red oak-------------	65	5	
						White oak-----------	65	5	
						Hemlock-------------	---	---	
Lo-------------- Linlithgo	2A	Slight	Slight	Slight	Slight	Sugar maple---------	70	3	Eastern white pine, Norway spruce, black walnut.
						Northern red oak----	80	4	
						Yellow-poplar-------	95	7	
						White ash-----------	80	7	
Lt**:									
Livingston-----	2W	Slight	Severe	Severe	Severe	Red maple-----------	40	2	
						American elm--------	---	---	
						Swamp white oak-----	55	---	
Madalin--------	2W	Slight	Severe	Severe	Severe	Red maple-----------	50	2	
						White ash-----------	50	2	
						Swamp white oak-----	55	---	
MaC**:									
Macomber-------	4A	Slight	Slight	Slight	Slight	Northern red oak----	70	4	Eastern white pine, red pine, Norway spruce.
						Sugar maple---------	65	3	
						Red spruce----------	55	9	
						American beech------	---	--	
						Paper birch---------	60	4	
						Eastern hemlock-----	---	--	
						White oak-----------	70	4	
Taconic--------	2D	Slight	Slight	Severe	Moderate	Northern red oak----	50	2	Eastern white pine, white spruce, Norway spruce.
						Sugar maple---------	50	2	
						Eastern hemlock-----	---	---	
						White oak-----------	50	2	
MbE**:									
Macomber-------	3R	Slight	Moderate	Slight	Slight	Sugar maple---------	65	3	Eastern white pine, red pine, Norway spruce.
						White spruce--------	65	10	
						Balsam fir----------	65	9	
						Red spruce----------	55	9	
						American beech------	---	--	
						Paper birch---------	60	4	
						Eastern hemlock-----	---	--	
						White oak-----------	70	4	
						Northern red oak----	70	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
MbE**:									
Taconic	2D	Slight	Moderate	Severe	Moderate	Northern red oak	50	2	Eastern white pine, red pine, Norway spruce.
						Sugar maple	50	2	
						White spruce	50	8	
						Balsam fir	50	7	
						Red spruce	40	6	
						American beech	---	--	
						Paper birch	53	3	
						Eastern hemlock	---	--	
						White oak	50	2	
MnA, MnB, MnC---Manlius	4A	Slight	Slight	Slight	Slight	Northern red oak	70	4	Eastern white pine, red pine, Norway spruce, European larch.
						Sugar maple	70	3	
						Red maple	60	3	
MnD---Manlius	4R	Slight	Moderate	Slight	Slight	Northern red oak	70	4	Eastern white pine, red pine, Norway spruce, European larch.
						Black cherry	70	3	
						Sugar maple	70	3	
						Red maple	60	3	
MsA, MsB---Massena	10W	Slight	Moderate	Moderate	Moderate	Eastern white pine	75	10	
						Northern red oak	70	4	
						Red maple	75	3	
						Hemlock	---	---	
NaB, NbC---Nassau	2D	Slight	Slight	Severe	Moderate	Sugar maple	50	2	Eastern white pine, red pine, black locust.
						Northern red oak	50	2	
						Eastern white pine	55	6	
						Chestnut oak	50	2	
NbD, NbE---Nassau	2D	Slight	Moderate	Severe	Moderate	Sugar maple	50	2	
						Northern red oak	50	2	
						Eastern white pine	55	6	
						Chestnut oak	50	2	
NgA, NgB---Niagara	3W	Slight	Moderate	Moderate	Moderate	Sugar maple	65	3	Eastern white pine, white spruce, Norway spruce.
						Northern red oak	70	4	
						White ash	75	3	
						Black cherry	70	3	
						Red maple	60	3	
Om---Occum	10A	Slight	Slight	Slight	Slight	Eastern white pine	80	10	Eastern white pine, red pine, Norway spruce, black walnut.
						Northern red oak	75	6	
						Sugar maple	70	6	
						White ash	80	6	
OvA, OvB---Ovid	4W	Slight	Moderate	Moderate	Moderate	Northern red oak	70	4	Eastern white pine, white spruce, Norway spruce.
						Sugar maple	60	3	
						Eastern white pine	70	9	
						Red maple	60	3	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
Pa---------- Palms	2W	Slight	Severe	Severe	Severe	Red maple----------	55	2	
						White ash----------	---	---	
						Quaking aspen-------	---	---	
						Hemlock------------	---	---	
PtB, PtC-------- Pittstown	4A	Slight	Slight	Slight	Slight	Northern red oak----	72	4	Eastern white pine, eastern hemlock, red pine, Norway spruce.
						Sugar maple---------	66	3	
						Eastern white pine--	80	10	
						Eastern hemlock-----	---	---	
						White ash----------	75	7	
PtD---------- Pittstown	4R	Moderate	Moderate	Slight	Slight	Northern red oak----	72	4	Eastern white pine, eastern hemlock, red pine, Norway spruce.
						Sugar maple---------	66	3	
						Eastern white pine--	80	10	
						Eastern hemlock-----	---	---	
						White ash----------	---	---	
PuA, PuB, PuC--- Punsit	4W	Slight	Moderate	Moderate	Moderate	Northern red oak----	75	4	Eastern white pine, white spruce, Norway spruce.
						Sugar maple---------	60	3	
						Hemlock------------	---	---	
Ra---------- Raynham	3W	Slight	Severe	Moderate	Severe	Red maple----------	65	3	Norway spruce, white spruce, eastern white pine.
						Eastern white pine--	65	8	
						Elm----------------	---	---	
						Eastern hemlock-----	---	---	
						Gray birch---------	---	---	
						Sugar maple---------	---	---	
						Northern red oak----	60	3	
ScA, ScB-------- Scio	4A	Slight	Slight	Slight	Slight	Northern red oak----	75	4	Eastern white pine, Norway spruce, white spruce.
						White ash----------	85	4	
						Sugar maple---------	70	3	
						Black cherry--------	80	4	
						Eastern hemlock-----	---	---	
						Eastern white pine--	85	10	
Sh---------- Shaker	7W	Slight	Severe	Severe	Severe	Eastern white pine--	57	7	
						Red maple----------	55	2	
						Sugar maple---------	55	2	
						Hemlock------------	---	---	
StB, StC-------- Stockbridge	4A	Slight	Slight	Slight	Slight	Northern red oak----	70	4	Eastern white pine, red pine, Norway spruce, European larch.
						Sugar maple---------	60	3	
						Eastern white pine--	75	10	
						American beech------	---	---	
						Eastern hemlock-----	---	---	
						White oak----------	70	6	
StD, StE-------- Stockbridge	4R	Moderate	Moderate	Slight	Slight	Northern red oak----	70	4	Eastern white pine, red pine, Norway spruce, European larch.
						Sugar maple---------	60	3	
						Eastern white pine--	75	10	
						American beech------	---	---	
						White oak----------	70	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
SuB**, SuC**:									
Stockbridge----	4A	Slight	Slight	Slight	Slight	Northern red oak----	70	4	Eastern white pine, red pine, Norway spruce, European larch.
						Sugar maple----------	60	3	
						Eastern white pine--	75	10	
						American beech------	---	---	
						Eastern hemlock-----	---	---	
						White oak-----------	70	4	
Farmington-----	2D	Slight	Slight	Severe	Moderate	Sugar maple----------	50	2	Eastern white pine, red pine, European larch.
						Northern red oak----	50	2	
						Eastern white pine--	55	6	
						American basswood---	55	2	
						White ash-----------	55	2	
						Eastern hemlock-----	---	--	
SvD**:									
Stockbridge----	4R	Moderate	Moderate	Slight	Slight	Northern red oak----	70	4	Eastern white pine, red pine, Norway spruce, European larch.
						Sugar maple----------	60	3	
						Eastern white pine--	75	10	
						American beech------	---	---	
						White oak-----------	70	4	
Farmington-----	2D	Moderate	Moderate	Severe	Moderate	Sugar maple----------	50	2	Eastern white pine, red pine, European larch.
						Northern red oak----	50	2	
						Eastern white pine--	55	6	
						American basswood---	55	2	
						White ash-----------	55	2	
						Eastern hemlock-----	---	---	
Sw---------- Sun	3W	Slight	Severe	Severe	Severe	Red maple-----------	65	3	
						Elm-----------------	65	3	
TmF**:									
Taconic--------	2R	Moderate	Severe	Severe	Moderate	Sugar maple----------	50	2	
						American beech------	---	--	
						Paper birch----------	53	3	
						Eastern hemlock-----	---	--	
						White oak-----------	50	2	
						Northern red oak----	50	2	
Macomber-------	3R	Severe	Severe	Slight	Slight	Sugar maple----------	65	3	
						American beech------	---	--	
						Paper birch----------	60	4	
						Eastern hemlock-----	---	--	
						White oak-----------	70	4	
						Northern red oak----	70	4	
UnA, UnB-------- Unadilla	3A	Slight	Slight	Slight	Slight	Sugar maple----------	70	3	Eastern white pine, Norway spruce, European larch, red pine.
						Eastern white pine--	85	10	
						Northern red oak----	80	4	
						White ash-----------	95	4	
						Black cherry--------	80	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
UnC---------- Unadilla	3R	Moderate	Slight	Slight	Slight	Sugar maple--------- Eastern white pine-- Northern red oak---- White ash---------- Black cherry--------	70 85 80 95 80	3 10 4 4 4	Eastern white pine, Norway spruce, European larch, red pine.
UnD---------- Unadilla	3R	Severe	Moderate	Slight	Slight	Sugar maple--------- Eastern white pine-- Northern red oak---- White ash---------- Black cherry--------	70 85 80 95 80	3 10 4 4 4	Eastern white pine, Norway spruce, European larch, red pine.
UrB**: Urban land.									
Hudson---------	4A	Slight	Slight	Slight	Slight	Northern red oak---- Sugar maple--------- Eastern white pine-- White ash----------	80 70 85 85	4 3 10 4	
Vergennes------	8C	Slight	Moderate	Severe	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	65 58 60	8 3 3	
Wa---------- Walpole	3W	Slight	Severe	Severe	Severe	Red maple---------- White ash---------- Eastern hemlock----- Eastern white pine--	75 61 --- 68	3 3 --- 8	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ad Alden	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus, erodes easily.	Severe: ponding.
Au Aurelie	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BeB Bernardston	Moderate: slope, percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight	Slight.
BeC Bernardston	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
BeD Bernardston	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
BeE Bernardston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bh Birdsall	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: wetness, ponding.	Severe: ponding.
BlA, BlB Blasdell	Moderate: small stones.	Moderate: small stones.	Severe: small stones.		Moderate: small stones.
BlC Blasdell	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.		Moderate: slope, small stones.
BlD Blasdell	Severe: slope.	Severe: slope.	Severe: slope, small stones.		Severe: slope.
BmA, BmB Blasdell			Severe: small stones.		
Ca Canandaigua	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Cc Carlisle	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Ce Castile	Moderate: small stones, wetness.	Moderate: small stones, wetness.	Severe: small stones.	Moderate: wetness.	Moderate: small stones, wetness.
CnB Cazenovia	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Severe: erodes easily.	Slight.
CnC Cazenovia	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CnD--- Cazenovia	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
CoA--- Collamer	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, percs slowly.	Slight---	Moderate: wetness.
CoB--- Collamer	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness, percs slowly.	Slight---	Moderate: wetness.
CoC--- Collamer	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
ElA--- Elmridge	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
ElB--- Elmridge	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
En--- Elnora	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
FaB--- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight---	Severe: thin layer.
FaC--- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight---	Severe: thin layer.
FaD--- Farmington	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, thin layer.
FdE*: Farmington---	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, thin layer.
Rock outcrop.					
Fn*: Fluvaquents.					
Udifluvents.					
Fr--- Fredon	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
GaA--- Georgia	Moderate: wetness.	Moderate: wetness.	Moderate: small stones.	Severe: erodes easily.	Moderate: large stones.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GaB---------- Georgia	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Severe: erodes easily.	Moderate: large stones.
GaC---------- Georgia	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Severe: erodes easily.	Moderate: large stones, slope.
Ha---------- Halsey	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.
HoA, HoB---------- Hoosic	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight----------	Moderate: droughty, small stones.
HoC---------- Hoosic	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: droughty, small stones.
HoD---------- Hoosic	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
HpE*:					
Hoosic----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Blasdell----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.		Severe: slope.
HvA*, HvB*:					
Hudson----------	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
Vergennes----------	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
HvC*:					
Hudson----------	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
Vergennes----------	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
HvD*:					
Hudson----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Vergennes----------	Severe: slope, wetness, percs slowly.	Severe: slope, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Severe: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HvE*: Hudson	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Vergennes	Severe: slope, wetness, percs slowly.	Severe: slope, percs slowly.	Severe: slope, wetness.	Severe: slope, erodes easily.	Severe: slope.
KnA*, KnB*: Kingsbury	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Rhinebeck	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
KrA Knickerbocker	Slight	Slight	Moderate: small stones.	Slight	Moderate: droughty.
KrB Knickerbocker	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
KrC Knickerbocker	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
KrD Knickerbocker	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
LaE, LaF Lanesboro	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
LmC*: Lanesboro	Moderate: large stones, percs slowly.	Moderate: large stones, percs slowly.	Severe: large stones, slope, small stones.	Slight	Moderate: large stones, wetness, slope.
Monarda	Severe: wetness.	Severe: wetness.	Severe: large stones, slope, small stones.	Severe: wetness.	Severe: wetness.
Ln Limerick	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: flooding, wetness.
Lo Linlithgo	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Lt*: Livingston	Severe: wetness, too clayey, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, percs slowly.	Severe: wetness, too clayey, erodes easily.	Severe: wetness, too clayey.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Lt*: Madalin	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
MaC: Macomber	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
Taconic	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: droughty, thin layer.
MbE: Macomber	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Taconic	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, thin layer.
MnA Manlius	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
MnB Manlius			Severe: small stones.	Slight	
MnC Manlius	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: small stones, slope.	Slight	Moderate: small stones, droughty.
MnD Manlius	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Moderate: slope.	Severe: slope.
MsA, MsB Massena	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
NaB Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, depth to rock.	Slight	Severe: thin layer.
NbC Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones.	Slight	Severe: thin layer.
NbD Nassau		Severe: slope, depth to rock.	Severe: slope, small stones.	Moderate: slope.	Severe: slope, thin layer.
NbE Nassau		Severe: slope, depth to rock.	Severe: slope, small stones.	Severe	Severe: slope, thin layer.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
NgA, NgB---------- Niagara	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Om---------- Occum	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
OvA, OvB---------- Ovid	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pa---------- Palms	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Pr*, Ps*. Pits					
PtB---------- Pittstown	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness, small stones.	Moderate: wetness.	Slight.
PtC---------- Pittstown	Moderate: slope, wetness.	Moderate: slope, wetness.	Severe: slope.	Moderate: wetness.	Moderate: slope.
PtD---------- Pittstown	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, wetness.	Severe: slope.
PuA, PuB---------- Punsit	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
PuC---------- Punsit	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.
Ra---------- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
Sa: Saprists. Aquents.					
ScA---------- Scio	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
ScB---------- Scio	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: erodes easily, wetness.	Moderate: wetness.
Sh---------- Shaker	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
StB---------- Stockbridge	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight----------	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
StC---------- Stockbridge	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
StD---------- Stockbridge	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
StE---------- Stockbridge	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SuB*: Stockbridge----------	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight----------	Slight.
Farmington----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight----------	Severe: thin layer.
SuC*: Stockbridge----------	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
Farmington----------	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight----------	Severe: thin layer.
SvD*: Stockbridge----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Farmington----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, thin layer.
Sw---------- Sun	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
TmF*: Taconic----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, thin layer.
Macomber----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Ud*. Udipsamments					
Ue*. Orthents					
UnA---------- Unadilla	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
UnB---------- Unadilla	Slight----------	Slight----------	Moderate: slope.	Moderate: erodes easily.	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
UnC---------- Unadilla	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
UnD---------- Unadilla	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
UrB*: Urban land.					
Hudson----------	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
Vergennes----------	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
Wa---------- Walpole	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ad---- Alden	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Au---- Aurelie	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
BeB---- Bernardston	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BeC---- Bernardston	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BeD---- Bernardston	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BeE---- Bernardston	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Bh---- Birdsall	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
BlA, BlB, BlC---- Blasdell	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Fair	Very poor.
BlD---- Blasdell	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
BmA, BmB---- Blasdell	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Ca---- Canandaigua	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Cc---- Carlisle	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Ce---- Castile	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CnB---- Cazenovia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CnC---- Cazenovia	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CnD---- Cazenovia	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CoA---- Collamer	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CoB---- Collamer	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CoC---- Collamer	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ElA---- Elmridge	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ElB---- Elmridge	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
En---- Elnora	Fair	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor.
FaB, FaC, FaD---- Farmington	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
FdE*: Farmington----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
Fn*: Fluvaquents.										
Udifluvents.										
Fr---- Fredon	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
GaA---- Georgia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GaB---- Georgia	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GaC---- Georgia	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ha---- Halsey	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
HoA, HoB, HoC, HoD- Hoosic	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
HpE*: Hoosic----	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Blasdell----	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
HvA*: Hudson----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Vergennes----	Fair	Fair	Poor	Good	Good	Poor	Poor	Fair	Fair	Poor.
HvB*: Hudson----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Vergennes----	Fair	Fair	Poor	Good	Good	Poor	Very poor.	Fair	Fair	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
HvC*:										
Hudson	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Vergennes	Fair	Fair	Poor	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
HvD*:										
Hudson	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Vergennes	Poor	Fair	Poor	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
HvE*:										
Hudson	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Vergennes	Very poor.	Fair	Poor	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
KnA*:										
Kingsbury	Fair	Fair	Fair	Good	Good	Poor	Fair	Fair	Good	Poor.
Rhinebeck	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
KnB*:										
Kingsbury	Fair	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Poor.
Rhinebeck	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
KrA, KrB, KrC Knickerbocker	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
KrD Knickerbocker	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
LaE Lanesboro	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LaF Lanesboro	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
LmC*:										
Lanesboro	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Monarda	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Ln Limerick	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Lo Linlithgo	Fair	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Lt*: Livingston	Very poor.	Poor	Poor	Poor	Poor	Poor	Fair	Poor	Poor	Poor.
Madalin	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
MaC*: Macomber	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Taconic	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MbE*: Macomber	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Taconic	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MnA, MnB Manlius	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
MnC Manlius	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
MnD Manlius	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
MsA Massena	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
MsB Massena	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NaB, NbC, NbD Nassau	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
NbE Nassau	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
NgA Niagara	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
NgB Niagara	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
Om Occum	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OvA Ovid	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
OvB Ovid	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pa Palms	Good	Poor	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Pr*, Ps*. Pits										
PtB---- Pittstown	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
PtC---- Pittstown	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
PtD---- Pittstown	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
PuA---- Punsit	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
PuB---- Punsit	Fair	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
PuC---- Punsit	Fair	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Ra---- Raynham	Poor	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Sa*: Saprists.										
Aquents.										
ScA---- Scio	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ScB---- Scio	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Sh---- Shaker	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
StB---- Stockbridge	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
StC---- Stockbridge	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
StD---- Stockbridge	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
StE---- Stockbridge	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SuB*: Stockbridge----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Farmington----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
SuC*: Stockbridge----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
SuC*: Farmington	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
SvD*: Stockbridge	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Farmington	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Sw Sun	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
TmF*: Taconic	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Macomber	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.
Ud*. Udipsamments										
Ue*. Orthents										
UnA, UnB Unadilla	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
UnC Unadilla	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
UnD Unadilla	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
UrB*: Urban land.										
Hudson	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Vergennes	Fair	Fair	Poor	Good	Good	Poor	Very poor.	Fair	Fair	Very poor.
Wa Walpole	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ad Alden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
Au Aurelie	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
BeB Bernardston	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Slight.
BeC Bernardston	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: slope.
BeD, BeE Bernardston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bh Birdsall	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
BlA Blasdell	Slight	Slight	Slight	Slight	Moderate: frost action.	Moderate: small stones.
BlB Blasdell	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
BlC Blasdell	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, small stones.
BlD Blasdell	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BmA, BmB Blasdell	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	
Ca Canandaigua	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Cc Carlisle	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
Ce Castile	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: small stones, wetness.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CnB---------- Cazenovia	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Moderate: low strength, wetness.	Slight.
CnC---------- Cazenovia	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Moderate: low strength, wetness, slope.	Moderate: slope.
CnD---------- Cazenovia	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.
CoA---------- Collamer	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
CoB---------- Collamer	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
CoC---------- Collamer	Severe: cutbanks cave, wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: wetness, slope.
ElA---------- Elmridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength, frost action.	Moderate: wetness.
ElB---------- Elmridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness.
En---------- Elnora	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty.
FaB---------- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: thin layer.
FaC---------- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: thin layer.
FaD---------- Farmington	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
FdE*: Farmington-------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
Rock outcrop.						
Fn*: Fluvaquents.						
Udifluvents.						

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Fr Fredon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
GaA Georgia	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: large stones.
GaB Georgia	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: large stones.
GaC Georgia	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: large stones, slope.
Ha Halsey	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
HoA Hoosic	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, small stones.
HoB Hoosic	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty, small stones.
HoC Hoosic	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, small stones.
HoD Hoosic	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HpE*: Hoosic	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Blasdell	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HvA*: Hudson	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action, low strength.	Moderate: wetness.
Vergennes	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
HvB*: Hudson	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: frost action, low strength.	Moderate: wetness.
Vergennes	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HvC*: Hudson	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: frost action, low strength.	Moderate: wetness, slope.
Vergennes	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength.	Moderate: wetness, slope.
HvD*, HvE*: Hudson	Severe: slope, wetness.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope, frost action, low strength.	Severe: slope.
Vergennes	Severe: wetness, slope.	Severe: wetness, slope.	Severe: wetness, slope.	Severe: wetness, slope.	Severe: low strength, slope.	Severe: slope.
KnA*, KnB*: Kingsbury	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: wetness.
Rhinebeck	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action, wetness.	Severe: wetness.
KrA Knickerbocker	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
KrB Knickerbocker	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
KrC Knickerbocker	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
KrD Knickerbocker	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LaE, LaF Lanesboro	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LmC*: Lanesboro	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: large stones, wetness, slope.
Monarda	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: wetness, frost action.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ln---------- Limerick	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, frost action.	Severe: flooding, wetness.
Lo---------- Linlithgo	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness.
Lt*: Livingston-------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: wetness, too clayey.
Madalin----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength, frost action.	Severe: wetness.
MaC*: Macomber---------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Moderate: small stones, droughty, slope.
Taconic----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: droughty, thin layer.
MbE*: Macomber---------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Taconic----------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, thin layer.
MnA---------- Manlius	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock, frost action.	Moderate: small stones, droughty.
MnB---------- Manlius	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	
MnC---------- Manlius	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, frost action.	Moderate: small stones, droughty.
MnD---------- Manlius	Severe: depth to rock, slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
MsA, MsB---------- Massena	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
NaB---------- Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: thin layer.
NbC---------- Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: thin layer.
NbD, NbE---------- Nassau	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, thin layer.
NgA, NgB---------- Niagara	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Om---------- Occum	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
OvA, OvB---------- Ovid	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Pa---------- Palms	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: ponding, frost action, subsides.	Severe: ponding, excess humus.
Pr*, Ps*. Pits						
PtB---------- Pittstown	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: wetness, frost action.	Slight.
PtC---------- Pittstown	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: slope.
PtD---------- Pittstown	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Severe: slope.
PuA, PuB---------- Punsit	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
PuC---------- Punsit	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: wetness, frost action.	Severe: wetness.
Ra---------- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
Sa*: Saprists. Aquents.						

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ScA---------- Scio	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
ScB---------- Scio	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
Sh---------- Shaker	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
StB---------- Stockbridge	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
StC---------- Stockbridge	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
StD, StE---------- Stockbridge	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SuB*: Stockbridge------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
Farmington-------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: thin layer.
SuC*: Stockbridge------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Farmington-------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: thin layer.
SvD*: Stockbridge------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Farmington-------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
Sw---------- Sun	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
TmF*: Taconic----------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, thin layer.
Macomber---------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ud*. Udipsamments						
Ue*. Orthents						
UnA---------- Unadilla	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Severe: frost action.	Slight.
UnB---------- Unadilla	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Severe: frost action.	Slight.
UnC---------- Unadilla	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: frost action.	Moderate: slope.
UnD---------- Unadilla	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
UrB*: Urban land.						
Hudson----------	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: frost action, low strength.	Moderate: wetness.
Vergennes--------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
Wa---------- Walpole	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ad Alden	Severe: ponding, percs slowly.	Slight	Severe: ponding.	Severe: ponding.	Poor: ponding.
Au Aurelie	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
BeB Bernardston	Severe: percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
BeC Bernardston	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
BeD, BeE Bernardston	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Bh Birdsall	Severe: ponding, percs slowly.	Slight	Severe: ponding.	Severe: ponding.	Poor: ponding.
BlA, BlB Blasdell	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones, seepage.
BlC Blasdell	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones, seepage.
BlD Blasdell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope, seepage.
BmA, BmB Blasdell	Moderate: flooding.	Severe: seepage, flooding.	Severe: seepage.	Severe: seepage.	Poor: seepage, small stones.
Ca Canandaigua	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Cc Carlisle	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
Ce Castile	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CnB---------- Cazenovia	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, small stones.
CnC---------- Cazenovia	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Fair: too clayey, small stones, slope.
CnD---------- Cazenovia	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
CoA, CoB---------- Collamer	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
CoC---------- Collamer	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, slope, wetness.
ElA---------- Elmridge	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: seepage.	Poor: too clayey, hard to pack.
ElB---------- Elmridge	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: seepage.	Poor: too clayey, hard to pack.
En---------- Elnora	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy.
FaB---------- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
FaC---------- Farmington	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
FaD---------- Farmington	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope.
FdE*: Farmington---------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope.
Rock outcrop.					
Fn*: Fluvaquents.					
Udifluvents.					

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Fr Fredon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
GaA Georgia	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Moderate: wetness.	Fair: small stones.
GaB Georgia	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones.
GaC Georgia	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness, slope.	Fair: small stones.
Ha Halsey	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.
HoA, HoB Hoosic	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
HoC Hoosic	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
HoD Hoosic	Severe: poor filter, slope.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: small stones, seepage, too sandy.
HpE*: Hoosic	Severe: poor filter, slope.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: small stones, seepage, too sandy.
Blasdell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope, seepage.
HvA*: Hudson	Severe: percs slowly, wetness.	Slight	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
Vergennes	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
HvB*: Hudson	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HvB*: Vergennes	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
HvC*: Hudson	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
Vergennes	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
HvD*, HvE*: Hudson	Severe: slope, percs slowly, wetness.	Severe: slope.	Severe: slope, too clayey, wetness.	Severe: slope.	Poor: slope, too clayey, hard to pack.
Vergennes	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: wetness, slope, too clayey.	Severe: wetness, slope.	Poor: too clayey, hard to pack, slope.
KnA*: Kingsbury	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Rhinebeck	Severe: percs slowly, wetness.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
KnB*: Kingsbury	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Rhinebeck	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
KrA, KrB Knickerbocker	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
KrC Knickerbocker	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
KrD Knickerbocker	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope, seepage, too sandy.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LaE, LaF---------- Lanesboro	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
LmC*: Lanesboro----------	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
Monarda----------	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ln---------- Limerick	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Lo---------- Linlithgo	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
Lt*: Livingston---------	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Madalin----------	Severe: percs slowly, wetness.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, hard to pack.
MaC*: Macomber----------	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Taconic----------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones.
MbE*: Macomber----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Taconic----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
MnA, MnB---------- Manlius	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, seepage, small stones.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MnC---------- Manlius	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, seepage, small stones.
MnD---------- Manlius	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: area reclaim, seepage, small stones.
MsA, MsB---------- Massena	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness, small stones.
NaB---------- Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
NbC---------- Nassau	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
NbD, NbE---------- Nassau	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Poor: slope, area reclaim, small stones.
NgA, NgB---------- Niagara	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Om---------- Occum	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
OvA---------- Ovid	Severe: wetness, percs slowly.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
OvB---------- Ovid	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Pa---------- Palms	Severe: subsides, ponding.	Severe: seepage, excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, seepage.	Poor: ponding, excess humus.
Pr*, Ps*. Pits					
PtB---------- Pittstown	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones.
PtC---------- Pittstown	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: slope, small stones.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PtD---------- Pittstown	Severe: slope, wetness, percs slowly.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Poor: slope.
PuA---------- Punsit	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
PuB---------- Punsit	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
PuC---------- Punsit	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
Ra---------- Raynham	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Sa*: Saprists. Aquents.					
ScA, ScB---------- Scio	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness, thin layer.
Sh---------- Shaker	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness, seepage.	Poor: too clayey, wetness, hard to pack.
StB---------- Stockbridge	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Fair: small stones.
StC---------- Stockbridge	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
StD, StE---------- Stockbridge	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
SuB*: Stockbridge--------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Fair: small stones.
Farmington---------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
SuC*: Stockbridge--------	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
Farmington---------	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SvD*:					
Stockbridge	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Farmington	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope.
Sw	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Sun					
TmF*:					
Taconic	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
Macomber	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Ud*.					
Udipsamments					
Ue*.					
Orthents					
UnA, UnB	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer.
Unadilla					
UnC	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Moderate: slope.	Fair: slope, thin layer.
Unadilla					
UnD	Severe: slope.	Severe: slope, seepage.	Severe: seepage, slope.	Severe: slope.	Poor: slope.
Unadilla					
UrB*:					
Urban land.					
Hudson	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
Vergennes	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Wa	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Walpole					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ad Alden	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, small stones, area reclaim.
Au Aurelie	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
BeB, BeC Bernardston	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BeD Bernardston	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
BeE Bernardston	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Bh Birdsall	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BlA, BlB, BlC Blasdell	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
BlD Blasdell	Fair: slope.	Improbable: small stones.	Probable	Poor: small stones, area reclaim, slope.
BmA, BmB Blasdell	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
Ca Canandaigua	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Cc Carlisle	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
Ce Castile	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.
CnB, CnC Cazenovia	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
CnD Cazenovia	Fair: low strength, wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CoA, CoB---------- Collamer	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
CoC---------- Collamer	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
ElA, ElB---------- Elmridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
En---------- Elnora	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
FaB, FaC---------- Farmington	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
FaD---------- Farmington	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
FdE*: Farmington----------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Rock outcrop.				
Fn*: Fluvaquents.				
Udifluvents.				
Fr---------- Fredon	Poor: wetness.	Probable----------	Probable----------	Poor: small stones, area reclaim, wetness.
GaA, GaB, GaC---------- Georgia	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Ha---------- Halsey	Poor: wetness.	Probable----------	Probable----------	Poor: small stones, area reclaim, wetness.
HoA, HoB, HoC---------- Hoosic	Good----------	Probable----------	Probable----------	Poor: small stones, area reclaim.
HoD---------- Hoosic	Fair: slope.	Probable----------	Probable----------	Poor: small stones, area reclaim, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
HpE*:				
Hoosic	Poor: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
Blasdell	Poor: slope.	Improbable: small stones.	Probable	Poor: small stones, area reclaim, slope.
HvA*, HvB*:				
Hudson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, too clayey.
Vergennes	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
HvC*:				
Hudson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, too clayey.
Vergennes	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
HvD*:				
Hudson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, thin layer, too clayey.
Vergennes	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
HvE*:				
Hudson	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, thin layer, too clayey.
Vergennes	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
KnA*, KnB*:				
Kingsbury	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Rhinebeck	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
KrA, KrB Knickerbocker	Good	Probable	Improbable: too sandy.	Fair: thin layer.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
KrC---------- Knickerbocker	Good----------	Probable----------	Improbable: too sandy.	Fair: slope, thin layer.
KrD---------- Knickerbocker	Fair: slope.	Probable----------	Improbable: too sandy.	Poor: slope.
LaE, LaF---------- Lanesboro	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
LmC*: Lanesboro----------	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Monarda----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
Ln---------- Limerick	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Lo---------- Linlithgo	Poor: wetness.	Probable----------	Probable----------	Poor: area reclaim, wetness.
Lt*: Livingston----------	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Madalin----------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
MaC*: Macomber----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Taconic----------	Poor: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
MbE*: Macomber----------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Taconic----------	Poor: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
MnA, MnB, MnC---------- Manlius	Poor: area reclaim.	Improbable: small stones, excess fines.	Improbable: thin layer, excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
MnD--- Manlius	Poor: area reclaim.	Improbable: small stones, excess fines.	Improbable: thin layer, excess fines.	Poor: small stones, slope, area reclaim.
MsA, MsB--- Massena	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
NaB, NbC--- Nassau	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
NbD--- Nassau	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, area reclaim, small stones.
NbE--- Nassau	Poor: slope, thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, area reclaim, small stones.
NgA, NgB--- Niagara	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Om--- Occum	Good---	Probable---	Improbable: too sandy.	Fair: area reclaim, thin layer.
OvA, OvB--- Ovid	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
Pa--- Palms	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess humus.
Pr*, Ps*. Pits				
PtB, PtC--- Pittstown	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
PtD--- Pittstown	Fair: slope, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
PuA, PuB, PuC--- Punsit	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
Ra--- Raynham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Sa*: Saprists.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Sa*: Aquents.				
ScA, ScB---------- Scio	Fair: wetness.	Probable----------	Probable----------	Fair: area reclaim.
Sh---------- Shaker	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
StB---------- Stockbridge	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
StC---------- Stockbridge	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
StD---------- Stockbridge	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
StE---------- Stockbridge	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
SuB*: Stockbridge----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Farmington----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
SuC*: Stockbridge----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
Farmington----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
SvD*: Stockbridge----------	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Farmington----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Sw---------- Sun	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
TmF*: Taconic----------	Poor: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
TmF*: Macomber	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Ud*. Udipsamments				
Ue*. Orthents				
UnA, UnB, UnC---------- Unadilla	Good----------	Probable----------	Probable----------	Fair: area reclaim.
UnD---------- Unadilla	Fair: slope.	Probable----------	Probable----------	Poor: slope.
UrB*: Urban land.				
Hudson----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, too clayey.
Vergennes----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Wa---------- Walpole	Poor: wetness.	Probable----------	Probable----------	Poor: small stones, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Ad---------- Alden	Slight---------	Severe: piping, wetness.	Slight---------	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily, rooting depth.
Au---------- Aurelie	Slight---------	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, droughty.
BeB---------- Bernardston	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly---	Rooting depth, percs slowly.
BeC, BeD, BeE----- Bernardston	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, percs slowly, rooting depth.
Bh---------- Birdsall	Slight---------	Severe: piping, ponding.	Severe: slow refill, cutbanks cave.	Percs slowly, frost action.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
B1A, B1B---------- Blasdell	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Favorable------	Droughty.
B1C, B1D---------- Blasdell	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope----------	Slope, droughty.
BmA, BmB---------- Blasdell	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Favorable------	Droughty.
Ca---------- Canandaigua	Slight---------	Severe: piping, wetness.	Severe: slow refill.	Frost action---	Erodes easily, wetness.	Wetness, erodes easily.
Cc---------- Carlisle	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
Ce---------- Castile	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, too sandy.	Droughty.
CnB---------- Cazenovia	Moderate: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily.
CnC, CnD---------- Cazenovia	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Erodes easily, slope.
CoA---------- Collamer	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, frost action.	Erodes easily, wetness.	Erodes easily, percs slowly.
CoB---------- Collamer	Moderate: seepage, slope.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Erodes easily, percs slowly.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
CoC---------- Collamer	Severe: slope.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
ElA---------- Elmridge	Slight---------	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, percs slowly.
ElB---------- Elmridge	Moderate: slope.	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Erodes easily, percs slowly.
En---------- Elnora	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, too sandy.	Droughty.
FaB---------- Farmington	Severe: depth to rock.	Severe: piping.	Severe: no water.	Deep to water	Depth to rock	Droughty, depth to rock.
FaC, FaD---------- Farmington	Severe: depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
FdE*: Farmington-------	Severe: depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop.						
Fn*: Fluvaquents.						
Udifluvents.						
Fr---------- Fredon	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action---	Wetness, too sandy.	Wetness.
GaA---------- Georgia	Moderate: seepage.	Severe: piping.	Severe: no water.	Percs slowly, frost action.	Large stones, erodes easily.	Large stones, erodes easily.
GaB---------- Georgia	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, frost action, slope.	Large stones, erodes easily.	Large stones, erodes easily.
GaC---------- Georgia	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, frost action, slope.	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
Ha---------- Halsey	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, too sandy.	Wetness.
HoA, HoB---------- Hoosic	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Too sandy------	Droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
HoC, HoD---------- Hoosic	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, too sandy.	Slope, droughty.
HpE*: Hoosic----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, too sandy.	Slope, droughty.
Blasdell---------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope----------	Slope, droughty.
HvA*: Hudson----------	Slight---------	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Percs slowly, erodes easily.
Vergennes--------	Slight---------	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly---	Erodes easily, wetness.	Wetness, erodes easily.
HvB*: Hudson----------	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Percs slowly, erodes easily.
Vergennes--------	Moderate: slope.	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, slope.	Erodes easily, wetness.	Wetness, erodes easily.
HvC*, HvD*, HvE*: Hudson----------	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, percs slowly, erodes easily.
Vergennes--------	Severe: slope.	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, slope.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
KnA*: Kingsbury--------	Slight---------	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Rhinebeck--------	Slight---------	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
KnB*: Kingsbury--------	Moderate: slope.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Rhinebeck--------	Moderate: slope.	Severe: wetness.	Severe: no water.	Slope, percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
KrA, KrB---------- Knickerbocker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy------	Droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
KrC, KrD---------- Knickerbocker	Severe: slope, seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, too sandy.	Slope, droughty.
LaE, LaF---------- Lanesboro	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, rooting depth.
LmC*: Lanesboro--------	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, large stones, percs slowly.	Large stones, slope, percs slowly.
Monarda----------	Severe: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Wetness, slope, rooting depth.
Ln---------- Limerick	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding, frost action.	Wetness, erodes easily.	Wetness, erodes easily.
Lo---------- Linlithgo	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, frost action, cutbanks cave.	Erodes easily, wetness, too sandy.	Wetness, erodes easily.
Lt*: Livingston-------	Slight---------	Severe: wetness, hard to pack.	Severe: slow refill.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Madalin----------	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly, erodes easily.
MaC*, MbE*: Macomber---------	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Taconic----------	Severe: seepage, depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
MnA---------- Manlius	Moderate: seepage, depth to rock.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, depth to rock.	Droughty, large stones, depth to rock.
MnB---------- Manlius	Moderate: seepage, depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, depth to rock.	Droughty, large stones, depth to rock.
MnC, MnD---------- Manlius	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, droughty, large stones.
MsA---------- Massena	Slight---------	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
MsB---------- Massena	Moderate: slope.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Wetness.
NaB---------- Nassau	Severe: depth to rock.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Large stones, depth to rock.	Large stones, droughty, depth to rock.
NbC, NbD, NbE----- Nassau	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
NgA---------- Niagara	Slight---------	Severe: piping, wetness.	Severe: slow refill.	Frost action---	Erodes easily, wetness.	Wetness, erodes easily.
NgB---------- Niagara	Moderate: slope.	Severe: piping, wetness.	Severe: slow refill.	Frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily.
Om---------- Occum	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Too sandy------	Favorable.
OvA---------- Ovid	Slight---------	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
OvB---------- Ovid	Moderate: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily.
Pa---------- Palms	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
Pr*, Ps*. Pits						
PtB---------- Pittstown	Moderate: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Percs slowly, wetness.	Percs slowly, wetness, rooting depth.
PtC, PtD---------- Pittstown	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, percs slowly, wetness.	Slope, percs slowly, rooting depth.
PuA---------- Punsit	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, droughty.
PuB---------- Punsit	Moderate: seepage, slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Wetness, droughty.
PuC---------- Punsit	Severe: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Wetness, slope, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Ra---------- Raynham	Slight---------	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
Sa*: Saprists. Aquents.						
ScA---------- Scio	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave, frost action.	Erodes easily, wetness.	Erodes easily.
ScB---------- Scio	Moderate: seepage, slope.	Severe: piping, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave, frost action.	Erodes easily, wetness.	Erodes easily.
Sh---------- Shaker	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
StB---------- Stockbridge	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, percs slowly.	Erodes easily, percs slowly.
StC, StD, StE----- Stockbridge	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
SuB*: Stockbridge------	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Farmington-------	Severe: depth to rock.	Severe: piping.	Severe: no water.	Deep to water	Depth to rock	Droughty, depth to rock.
SuC*, SvD*: Stockbridge------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Farmington-------	Severe: depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Sw---------- Sun	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, rooting depth, percs slowly.
TmF*: Taconic----------	Severe: seepage, depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Macomber---------	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Ud*. Udipsamments						

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Ue*. Orthents						
UnA---------- Unadilla	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
UnB---------- Unadilla	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
UnC, UnD---------- Unadilla	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
UrB*: Urban land.						
Hudson----------	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Percs slowly, erodes easily.
Vergennes--------	Moderate: slope.	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, slope.	Erodes easily, wetness.	Wetness, erodes easily.
Wa---------- Walpole	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, too sandy.	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ad---------- Alden	0-7	Mucky silt loam	ML, OL	A-7, A-5	0	80-100	75-100	65-95	55-85	40-50	5-15
	7-28	Silt loam, silty clay loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	80-100	75-100	65-95	55-85	20-35	5-15
	28-60	Gravelly loam, fine sandy loam, silty clay loam.	CL, GC, SC, CL-ML	A-2, A-4, A-6	0-5	60-95	50-90	45-90	30-85	20-35	5-15
Au---------- Aurelie	0-6	Silt loam--------	SM, ML	A-4, A-5, A-6, A-7	0-5	80-95	75-90	65-90	45-80	30-45	2-12
	6-22	Channery loam, silt loam, channery fine sandy loam.	CL-ML, CL, SC, SM-SC	A-4, A-6	0-10	80-95	70-90	55-90	35-80	20-35	5-15
	22-60	Channery loam, silt loam, channery clay loam.	CL, SC	A-4, A-6	0-10	80-95	70-90	60-90	45-80	25-35	8-15
BeB, BeC, BeD, BeE---------- Bernardston	0-8	Silt loam--------	ML, CL-ML	A-4, A-6, A-7	0-5	80-100	70-95	65-95	50-85	24-45	4-14
	8-22	Channery silt loam, silt loam, loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-10	65-95	50-90	45-90	30-80	22-35	2-10
	22-60	Channery silt loam, loam, channery loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-10	65-90	50-85	45-85	30-75	20-32	2-8
Bh---------- Birdsall	0-9	Silt loam--------	ML, OL, CL-ML	A-4	0	100	100	90-100	70-90	<30	NP-7
	9-25	Silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<30	NP-7
	25-60	Silt loam, very fine sandy loam, silty clay loam.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<30	NP-7
BlA, BlB, BlC, BlD---------- Blasdell	0-10	Channery loam----	GM, SM, ML	A-5, A-2	0-15	55-80	50-75	40-75	25-70	40-50	5-10
	10-30	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM, GC	A-1, A-2, A-4	0-15	25-60	20-55	15-55	10-50	25-35	5-10
	30-60	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM, GP-GM	A-1, A-2	0-15	15-45	10-40	10-40	5-35	25-35	5-10
BmA, BmB--------- Blasdell	0-8		GM, SM, ML	A-5, A-2	0-15	55-80	50-75	40-75	25-70	40-50	5-10
	8-33	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM, GC	A-1, A-2, A-4	0-15	25-60	20-55	15-55	10-50	25-35	5-10
	33-60	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM, GP-GM	A-1, A-2	0-15	15-45	10-40	10-40	5-35	25-35	5-10
Ca---------- Canandaigua	0-8	Silt loam--------	ML, MH	A-4, A-5, A-7	0	95-100	95-100	90-100	85-100	35-55	5-15
	8-34	Silt loam, very fine sandy loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	70-95	20-40	5-15
	34-60	Silt loam, very fine sandy loam.	ML, CL, CL-ML	A-4	0	95-100	95-100	90-100	70-95	20-30	3-10

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Cc---------- Carlisle	0-80	Muck----------	PT	A-8	---	---	---	---	---	---	---
Ce---------- Castile	0-8	Gravelly silt loam.	ML, GM, SM, CL-ML	A-2, A-4	0-5	55-85	50-75	40-75	30-65	<30	NP-10
	8-24	Very gravelly loam, very gravelly sandy loam, gravelly silt loam.	GM, SM, ML, GM-GC	A-1, A-2, A-4	5-10	40-75	35-70	15-65	5-60	<30	NP-10
	24-72	Very gravelly sand, very gravelly loam, very gravelly loamy sand.	GW, GP, GW-GM, SW-SM	A-1, A-2, A-4	5-10	30-85	25-70	10-45	0-40	---	NP
CnB, CnC, CnD---- Cazenovia	0-10	Silt loam---------	ML, SM	A-4, A-7	0	80-100	75-95	60-95	40-90	35-45	5-15
	10-34	Silty clay loam, clay loam, gravelly clay loam.	CL, CL-ML	A-4, A-6	0-5	65-100	65-95	60-95	55-90	25-35	5-15
	34-60	Gravelly silty clay loam, gravelly loam, silt loam.	CL, GM-GC, CL-ML, SC	A-4, A-6, A-2	0-5	55-90	50-90	40-85	30-80	20-35	5-15
CoA, CoB, CoC---- Collamer	0-11	Silt loam---------	ML, SM, CL-ML, SM-SC	A-4	0	95-100	95-100	65-100	40-90	25-35	5-10
	11-25	Silt loam, very fine sandy loam, fine sandy loam.	ML, CL, CL-ML, SM-SC	A-4	0	95-100	95-100	65-100	40-90	20-30	3-10
	25-47	Silt loam, silty clay loam, sandy clay loam.	CL, CL-ML, ML	A-4, A-6	0	95-100	95-100	90-100	75-95	20-35	5-15
	47-80	Silt loam, very fine sand, silty clay loam.	ML, SM, CL-ML, CL	A-4, A-6	0	95-100	95-100	70-100	40-90	20-35	3-15
E1A, E1B--------- Elmridge	0-10	Very fine sandy loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	10-23	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	23-80	Silty clay loam, silty clay, clay.	CL, CL-ML	A-6, A-7	0	100	100	90-100	75-95	25-50	5-25
En---------- Elnora	0-10	Fine sandy loam	SM, ML	A-2, A-4	0	100	100	70-95	25-60	---	NP
	10-21	Loamy fine sand, fine sand.	SM	A-2, A-4	0	100	100	70-95	25-45	---	NP
	21-60	Fine sand, loamy fine sand.	SM	A-2, A-4	0	100	100	60-85	20-45	---	NP
FaB, FaC, FaD---- Farmington	0-8	Silt loam---------	ML, CL, SM, SC	A-2, A-4, A-6	0-5	80-95	75-90	50-85	30-80	20-35	3-15
	8-16	Silt loam, loam, gravelly fine sandy loam.	ML, CL, GM, GC	A-2, A-4, A-6, A-1	0-5	60-95	55-90	35-85	20-80	20-35	3-15
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
FdE*:											
Farmington	0-8	Silt loam	ML, CL, SM, SC	A-2, A-4, A-6	0-5	80-95	75-90	50-85	30-80	20-35	3-15
	8-16	Silt loam, loam, gravelly fine sandy loam.	ML, CL, GM, GC	A-2, A-4, A-6, A-1	0-5	60-95	55-90	35-85	20-80	20-35	3-15
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Fn*:											
Fluvaquents.											
Udifluvents.											
Fr	0-7	Silt loam	ML, CL, SC, SM	A-2, A-4, A-1	0-2	80-100	75-95	30-90	15-70	20-30	NP-10
Fredon	7-32	Loam, silt loam, gravelly sandy loam.	SM, GC, ML, CL	A-2, A-4, A-1	0-2	60-100	50-95	30-85	15-70	20-30	NP-10
	32-60	Stratified very gravelly sand to loamy fine sand.	GP, GM, GW, GW-GM	A-1, A-2	0-5	30-90	25-85	10-60	0-35	---	NP
GaA, GaB, GaC	0-9	Silt loam	ML, CL, CL-ML	A-4	0-10	90-100	85-100	70-100	50-90	<30	NP-10
Georgia	9-32	Loam, silt loam, very gravelly fine sandy loam.	ML, SM, CL, SC	A-4, A-2	0-20	50-100	45-100	30-95	20-80	<25	NP-10
	32-60	Loam, very gravelly fine sandy loam, silt loam.	ML, SM, CL, SC	A-4, A-2	0-20	50-100	45-100	30-95	20-80	<25	NP-10
Ha	0-6	Mucky silt loam	ML, CL, SM	A-2, A-4	0-2	80-100	75-100	35-90	25-90	20-30	3-10
Halsey	6-23	Loam, silt loam, gravelly fine sandy loam.	SM, GC, ML, CL	A-2, A-4	0-2	65-100	50-100	35-90	30-85	20-30	3-10
	23-60	Stratified sandy loam to very gravelly sand.	SP, GP, GM, SM	A-1, A-2, A-3	5-10	30-90	25-85	20-70	0-35	---	NP
HoA, HoB, HoC, HoD	0-8	Gravelly sandy loam.	GM, SM, ML	A-1, A-2, A-4	5-10	55-80	50-70	30-70	15-60	30-45	2-10
Hoosic	8-15	Gravelly sandy loam, very gravelly sandy loam, gravelly loam.	GM, SM, GP-GM, SP-SM	A-1, A-2, A-4	5-10	40-75	35-65	20-60	10-45	20-30	2-8
	15-60	Very gravelly sand, very gravelly loamy sand.	GM, GP, SP, SM	A-1	10-15	35-65	30-50	15-40	2-20	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HpE*:											
Hoosic	0-8	Gravelly sandy loam.	GM, SM, ML	A-1, A-2, A-4	5-10	55-80	50-70	30-70	15-60	30-45	2-10
	8-15	Gravelly sandy loam, very gravelly sandy loam, gravelly loam.	GM, SM, GP-GM, SP-SM	A-1, A-2, A-4	5-10	40-75	35-65	20-60	10-45	20-30	2-8
	15-60	Very gravelly sand, very gravelly loamy sand.	GM, GP, SP, SM	A-1	10-15	35-65	30-50	15-40	2-20	---	NP
Blasdell	0-10	Channery loam	GM, SM, ML	A-5, A-2	0-15	55-80	50-75	40-75	25-70	40-50	5-10
	10-30	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM, GC	A-1, A-2, A-4	0-15	25-60	20-55	15-55	10-50	25-35	5-10
	30-60	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM, GP-GM	A-1, A-2	0-15	15-45	10-40	10-40	5-35	25-35	5-10
HvA*, HvB*, HvC*, HvD*, HvE*:											
Hudson	0-10	Silt loam	ML, CL-ML, OL, CL	A-4, A-6, A-7	0	95-100	95-100	85-100	65-95	25-48	5-19
	10-15	Silty clay, silty clay loam.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	80-100	35-65	15-35
	15-26	Silty clay, silty clay loam.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	80-100	35-65	15-35
	26-60	Silty clay, silt loam, clay.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	60-100	35-65	15-35
Vergennes	0-12	Silty clay loam	MH, CL, CH	A-7	0	100	100	90-100	85-100	40-80	20-40
	12-15	Clay	MH, CH	A-7	0	100	100	95-100	75-100	50-80	20-45
	15-29	Clay	MH, CH	A-7	0	100	100	95-100	95-100	50-80	20-45
	29-60	Clay	MH, CH	A-7	0	100	100	95-100	95-100	50-80	20-45
KnA*, KnB*:											
Kingsbury	0-11	Silty clay loam	ML, MH	A-7	0	100	100	90-100	80-95	40-55	11-20
	11-29	Clay	MH, CH	A-7	0	100	100	90-100	90-100	50-65	21-35
	29-60	Clay	MH, CH	A-7	0	100	100	90-100	90-100	50-65	21-35
Rhinebeck	0-12	Silt loam	ML, MH, CL, CH	A-6, A-7	0	80-100	75-100	70-100	60-90	30-55	10-25
	12-29	Silty clay loam, silty clay.	CH, CL	A-7, A-6	0	90-100	85-100	80-100	70-100	30-55	15-30
	29-60	Silty clay loam, silty clay, clay.	CH, CL	A-7, A-6	0	90-100	85-100	80-100	70-100	30-55	15-30
KrA, KrB, KrC, KrD---------- Knickerbocker	0-12	Fine sandy loam	SM, ML	A-2, A-4, A-1-B	0	75-100	75-100	40-85	20-55	---	NP
	12-20	Fine sandy loam, sandy loam.	SM, ML	A-2, A-4, A-1-B	0	75-100	75-100	40-85	20-55	---	NP
	20-35	Loamy fine sand, loamy sand.	SP-SM, SM	A-2, A-1-B	0	75-100	75-100	40-75	10-30	---	NP
	35-60	Loamy fine sand, loamy sand, sand.	SP-SM, SM	A-1	0	75-100	75-100	40-75	5-15	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LaE, LaF--------- Lanesboro	0-4	Channery silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6, A-7	0-10	65-80	50-70	45-70	30-65	24-45	4-14
	4-41	Channery silt loam, silt loam, loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-10	65-95	50-90	45-90	30-80	22-35	2-10
	41-60	Channery loam, channery silt loam, loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-10	65-90	50-85	45-85	30-75	20-32	2-8
LmC*:											
Lanesboro-------	0-4	Silt loam--------	ML, CL-ML, SM, SM-SC	A-2, A-4, A-6, A-7	10-20	60-90	45-85	40-85	30-75	24-45	4-14
	4-41	Channery silt loam, silt loam, loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-10	65-95	50-90	45-90	30-80	22-35	2-10
	41-60	Channery loam, channery silt loam, loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-10	65-90	50-85	45-85	30-75	20-32	2-8
Monarda---------	0-7	Silt loam--------	SM, ML	A-2, A-4	5-10	75-95	60-95	40-95	25-70	<40	NP-10
	7-20	Gravelly silt loam, silt loam, gravelly very fine sandy loam.	ML, SM	A-4	0-10	75-95	60-95	45-95	35-85	<40	NP-10
	20-60	Gravelly silt loam, silt loam, gravelly very fine sandy loam.	ML, SM, GM	A-4	0-10	70-95	60-95	45-95	35-85	<35	NP-10
Ln----------	0-6	Silt loam--------	ML	A-4	0	100	100	95-100	80-95	---	NP
Limerick	6-21	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	80-95	---	NP
	21-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	80-95	---	NP
Lo----------	0-21	Silt loam--------	ML	A-4, A-7	0	100	95-100	80-100	60-90	35-45	5-15
Linlithgo	21-37	Silt loam, loam, gravelly loam.	CL, SC, CL-ML	A-4, A-6	0-5	75-100	70-100	60-100	35-90	20-30	5-15
	37-60	Gravelly loamy sand, very gravelly sand.	SM, SW-SM, GM, GW-GM	A-1	5-10	30-60	25-55	15-40	5-15	---	NP
Lt*:											
Livingston------	0-9	Silty clay loam	MH, ML	A-7	0	100	100	90-100	85-100	40-85	10-40
	9-37	Clay----------	MH	A-7	0	100	100	100	95-100	50-85	20-40
	37-60	Clay----------	MH	A-7	0	100	100	100	95-100	50-85	20-40
Madalin---------	0-8	Silt loam--------	ML, MH, OL, OH	A-6, A-7	0	95-100	95-100	85-100	65-100	35-65	10-25
	8-42	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	95-100	95-100	85-100	70-100	38-65	20-35
	42-60	Silty clay, clay, silty clay loam.	CL, CH	A-6, A-7	0	75-100	70-100	65-100	60-100	35-60	15-35

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MaC*, MbE*:											
Macomber	0-6	Channery silt loam.	GM, SM, ML, CL-ML	A-2, A-4, A-6	0-15	55-80	50-75	40-75	30-70	15-35	3-15
	6-22	Very channery silt loam, very channery loam.	GM, GM-GC, GC	A-1, A-2, A-4	5-15	30-55	25-50	20-50	15-45	15-30	3-15
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Taconic	0-6	Channery silt loam.	GM, SM, ML, CL-ML	A-2, A-4, A-6	0-15	55-80	50-75	40-75	30-70	15-35	3-15
	6-14	Very channery silt loam, very channery loam.	GM, GC	A-1, A-2, A-4	5-15	30-60	25-55	20-55	15-50	15-30	3-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MnA	0-6	Channery silt loam.	ML, GM, SM, CL-ML	A-4, A-2	5-25	55-80	50-75	35-75	25-70	25-35	4-10
Manlius	6-27	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM	A-2, A-4, A-1	10-25	25-60	20-55	15-55	10-50	25-35	4-10
	27-34	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM	A-1, A-2, A-4	10-25	20-60	15-55	10-55	5-50	25-35	4-10
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MnB	0-6		ML, GM, SM, CL-ML	A-4, A-2	5-25	55-80	50-75	35-75	25-70	25-35	4-10
Manlius	6-27	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM	A-2, A-4, A-1	10-25	25-60	20-55	15-55	10-50	25-35	4-10
	27-34	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM	A-1, A-2, A-4	10-25	20-60	15-55	10-55	5-50	25-35	4-10
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MnC, MnD	0-6	Channery silt loam.	ML, GM, SM, CL-ML	A-4, A-2	5-25	55-80	50-75	35-75	25-70	25-35	4-10
Manlius	6-27	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM	A-2, A-4, A-1	10-25	25-60	20-55	15-55	10-50	25-35	4-10
	27-34	Very channery silt loam, very channery loam.	GM, GM-GC, GW-GM	A-1, A-2, A-4	10-25	20-60	15-55	10-55	5-50	25-35	4-10
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MsA, MsB	0-7	Silt loam	CL, SC	A-6, A-7	0	80-95	75-90	65-90	45-80	35-45	12-20
Massena	7-23	Gravelly fine sandy loam, gravelly sandy loam, loam.	GC, CL, CL-ML, SM-SC	A-4, A-6, A-2, A-1	0-5	55-95	50-90	35-85	15-65	15-25	5-15
	23-80	Gravelly fine sandy loam, gravelly loam, very gravelly sandy loam.	GC, CL, SC, CL-ML	A-4, A-6, A-2, A-1	0-5	40-95	35-90	20-85	10-65	15-25	5-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
NaB, NbC, NbD, NbE---------- Nassau	0-3	Channery silt loam.	ML, GM, SM	A-2, A-4	5-20	55-85	45-80	30-75	25-70	25-37	1-10
	3-17	Very channery silt loam, very channery loam.	GM, GM-GC	A-2, A-4, A-1	10-25	30-60	25-55	20-55	15-50	20-35	1-10
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
NgA, NgB--------- Niagara	0-8	Silt loam--------	ML	A-4, A-7, A-6, A-5	0	95-100	95-100	70-100	55-90	30-45	5-15
	8-23	Silt loam, silty clay loam, very fine sandy loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	70-100	25-35	3-13
	23-60	Silt loam, very fine sandy loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	70-100	25-35	3-13
Om---------- Occum	0-10	Loam----------	SM, ML	A-4	0	95-100	75-100	60-90	35-85	<35	NP-6
	10-17	Sandy loam, fine sandy loam, loam.	SM, ML	A-2, A-4	0	95-100	75-100	45-85	25-70	<25	NP-4
	17-28	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	95-100	75-100	45-85	25-50	<25	NP-3
	28-60	Stratified loamy fine sand to very gravelly coarse sand.	SM, SP-SM, SP	A-1, A-2, A-3	0-10	65-100	30-100	15-75	0-25	---	NP
OvA, OvB--------- Ovid	0-13	Silt loam--------	ML, SM, SM-SC, CL-ML	A-4, A-6, A-7, A-2	0	80-100	75-100	50-95	30-90	25-45	5-15
	13-34	Silty clay loam, clay loam, gravelly clay loam.	CL, CL-ML, SC, GM-GC	A-4, A-6	0-5	65-100	65-95	60-95	45-90	20-35	5-15
	34-80	Silty clay loam, clay loam, gravelly clay loam.	CL, GC, SC, CL-ML	A-4, A-6	0-5	65-90	60-90	55-85	40-80	20-35	5-15
Pa---------- Palms	0-20	Muck----------	PT	A-8	---	---	---	---	---	---	---
	20-60	Clay loam, silty clay loam, fine sandy loam.	CL-ML, CL	A-4, A-6	0	85-100	80-100	70-95	50-90	25-40	5-20
Pr*, Ps*. Pits											
PtB, PtC, PtD---- Pittstown	0-8	Silt loam--------	ML, CL-ML	A-4, A-6, A-7	0-5	80-100	70-95	65-95	50-85	25-45	4-15
	8-21	Silt loam, channery loam, very fine sandy loam.	ML, SM, CL-ML, SM-SC	A-2, A-4	0-15	65-95	60-90	50-90	30-80	20-35	2-10
	21-60	Channery silt loam, channery loam, very fine sandy loam.	ML, SM, CL-ML, SM-SC	A-2, A-4	0-15	60-95	55-85	45-85	30-75	20-30	2-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PuA, PuB, PuC---- Punsit	0-6	Silt loam--------	ML	A-4	0-5	90-100	85-95	75-95	60-85	20-35	NP-10
	6-23	Loam, silt loam, gravelly loam.	ML, GM, SM	A-4	0-5	65-100	60-95	50-95	40-85	20-35	NP-10
	23-60	Loam, silt loam, gravelly loam.	ML, GM, SM	A-4	0-10	55-90	50-85	40-80	35-75	15-30	NP-7
Ra---------- Raynham	0-10	Very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	80-100	55-95	<25	NP-5
	10-21	Silt loam, silt, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	80-100	55-95	<25	NP-5
	21-60	Silt loam, silt, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	80-100	70-95	<25	NP-5
Sa*: Saprists.											
Aquents.											
ScA, ScB--------- Scio	0-9	Silt loam--------	ML	A-4	0	100	95-100	90-100	70-90	<20	NP-4
	9-31	Silt loam, very fine sandy loam.	ML	A-4	0	100	95-100	90-100	70-90	<20	NP-4
	31-80	Stratified very gravelly sand to silt loam.	ML, SM, SP, GP-GM	A-4, A-2, A-1, A-3	0	35-95	30-90	15-85	2-80	<10	NP-4
Sh---------- Shaker	0-10	Loam----------	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	10-22	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	22-80	Silty clay, silty clay loam, clay.	CL, CL-ML	A-6, A-7	0	100	95-100	90-100	75-95	25-50	5-25
StB, StC, StD, StE---------- Stockbridge	0-9	Silt loam--------	ML, CL-ML	A-4	0-10	80-95	75-90	65-85	50-75	20-40	3-12
	9-29	Loam, silt loam, gravelly loam.	ML, CL-ML	A-4	0-10	70-95	65-90	60-85	50-75	20-40	3-12
	29-60	Gravelly loam, silt loam, very gravelly fine sandy loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	50-90	35-85	30-80	25-75	15-40	NP-12
SuB*, SuC*, SvD*: Stockbridge-----	0-9	Silt loam--------	ML, CL-ML	A-4	0-10	80-95	75-90	65-85	50-75	20-40	3-12
	9-29	Loam, silt loam, gravelly loam.	ML, CL-ML	A-4	0-10	70-95	65-90	60-85	50-75	20-40	3-12
	29-60	Gravelly loam, silt loam, very gravelly fine sandy loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	50-90	35-85	30-80	25-75	15-40	NP-12
Farmington------	0-8	Silt loam--------	ML, CL, SM, SC	A-2, A-4, A-6	0-5	80-95	75-90	50-85	30-80	20-35	3-15
	8-16	Silt loam, loam, gravelly fine sandy loam.	ML, CL, GM, GC	A-2, A-4, A-6, A-1	0-5	60-95	55-90	35-85	20-80	20-35	3-15
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Sw---------- Sun	0-8	Silt loam--------	ML, CL-ML, SM, SM-SC	A-1, A-2, A-4	0-5	80-100	75-100	45-95	20-85	<10	NP-5
	8-25	Gravelly fine sandy loam, sandy loam, silt loam.	GM, ML, SM, SM-SC	A-1, A-2, A-4	0-5	55-95	50-90	30-85	15-65	<10	NP-5
	25-60	Gravelly fine sandy loam, gravelly loam, very gravelly sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2, A-4	0-5	45-75	40-70	25-65	15-50	<10	NP-5
TmF*:											
Taconic----------	0-6	Channery silt loam.	GM, SM, ML, CL-ML	A-2, A-4, A-6	0-15	55-80	50-75	40-75	30-70	15-35	3-15
	6-14	Very channery silt loam, very channery loam.	GM, GC	A-1, A-2, A-4	5-15	30-60	25-55	20-55	15-50	15-30	3-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Macomber--------	0-6	Channery silt loam.	GM, SM, ML, CL-ML	A-2, A-4, A-6	0-15	55-80	50-75	40-75	30-70	15-35	3-15
	6-22	Very channery silt loam, very channery loam.	GM, GM-GC, GC	A-1, A-2, A-4	5-15	30-55	25-50	20-50	15-45	15-30	3-15
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ud*. Udipsamments											
Ue*. Orthents											
UnA, UnB, UnC, UnD---------- Unadilla	0-9	Silt loam--------	ML	A-4	0	100	95-100	90-100	70-90	<35	NP-10
	9-60	Silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<25	NP-10
UrB*: Urban land.											
Hudson----------	0-10	Silt loam--------	ML, CL-ML, OL, CL	A-4, A-6, A-7	0	95-100	95-100	85-100	65-95	25-48	5-19
	10-15	Silty clay, silty clay loam.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	80-100	35-65	15-35
	15-26	Silty clay, silty clay loam.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	80-100	35-65	15-35
	26-60	Silty clay, silt loam, clay.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	60-100	35-65	15-35
Vergennes-------	0-6	Silty clay loam	MH, CH	A-7	0	100	100	90-100	85-100	40-80	20-40
	6-16	Clay----------	MH, CH	A-7	0	100	100	95-100	75-100	50-80	20-45
	16-29	Clay----------	MH, CH	A-7	0	100	100	95-100	95-100	50-80	20-45
	29-65	Clay----------	MH, CH	A-7	0	100	100	95-100	95-100	50-80	20-45

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Wa----------	0-11	Sandy loam-------	SM, ML	A-2, A-4	0-5	90-100	75-100	55-90	25-60	<25	NP-3
Walpole	11-20	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-85	20-50	---	NP
	20-60	Stratified loamy fine sand to very gravelly coarse sand.	SP, SM, GP, GM	A-1, A-2, A-3	0-20	55-100	50-100	25-80	2-30	---	NP

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
Ad----------	0-7	15-27	1.10-1.40	0.6-2.0	0.16-0.22	5.1-7.3	Low----------	0.37	5	10-25
Alden	7-28	18-35	1.20-1.50	0.2-0.6	0.14-0.20	5.6-7.3	Low----------	0.37		
	28-60	18-35	1.50-1.80	0.06-0.6	0.08-0.15	6.1-8.4	Low----------	0.28		
Au----------	0-6	10-25	0.90-1.20	0.6-2.0	0.18-0.30	3.6-6.0	Low----------	0.24	3	4-8
Aurelie	6-22	15-25	1.20-1.50	0.6-2.0	0.09-0.20	4.5-6.5	Low----------	0.17		
	22-60	20-35	1.65-1.95	<0.2	0.02-0.10	5.1-7.3	Low----------	0.24		
BeB, BeC, BeD, BeE----------	0-8	2-12	1.00-1.15	0.6-2.0	0.15-0.22	4.5-6.0	Low----------	0.28	3	2-5
Bernardston	8-22	2-12	1.25-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.37		
	22-60	1-12	1.75-1.90	0.06-0.2	0.07-0.16	4.5-6.0	Low----------	0.28		
Bh----------	0-9	3-16	1.00-1.10	0.2-2.0	0.17-0.30	4.5-6.0	Low----------	0.49	5	2-8
Birdsall	9-25	3-16	1.20-1.50	0.2-0.6	0.15-0.26	5.1-7.3	Low----------	0.64		
	25-60	3-16	1.20-1.50	0.06-0.2	0.15-0.26	5.1-7.3	Low----------	0.64		
BlA, BlB, BlC, BlD----------	0-10	6-18	1.10-1.40	2.0-6.0	0.10-0.17	4.5-6.0	Low----------	0.28	3	3-6
Blasdell	10-30	6-18	1.25-1.55	2.0-6.0	0.07-0.11	4.5-6.0	Low----------	0.17		
	30-60	6-18	1.45-1.65	2.0-6.0	0.05-0.09	5.1-6.5	Low----------	0.17		
BmA, BmB----------	0-8	6-18	1.10-1.40	2.0-6.0	0.10-0.17	4.5-6.0	Low----------	0.28	3	3-6
Blasdell	8-33	6-18	1.25-1.55	2.0-6.0	0.07-0.11	4.5-6.0	Low----------	0.17		
	33-60	6-18	1.45-1.65	2.0-6.0	0.05-0.09	5.1-6.5	Low----------	0.17		
Ca----------	0-8	18-35	1.00-1.25	0.6-2.0	0.20-0.35	5.6-7.8	Low----------	0.49	5	4-15
Canandaigua	8-34	18-35	1.20-1.40	0.2-0.6	0.19-0.20	6.1-7.8	Low----------	0.49		
	34-60	18-35	1.15-1.40	0.2-0.6	0.19-0.20	6.6-8.4	Low----------	0.64		
Cc----------	0-80	---	0.13-0.23	0.2-6.0	0.35-0.45	4.5-7.3	----------	----	2	>70
Carlisle										
Ce----------	0-8	6-18	1.10-1.40	0.6-6.0	0.09-0.16	4.5-6.0	Low----------	0.24	3	4-10
Castile	8-24	4-15	1.25-1.55	2.0-6.0	0.05-0.13	4.5-6.0	Low----------	0.17		
	24-72	2-10	1.45-1.65	>6.0	0.01-0.02	5.1-7.3	Low----------	0.17		
CnB, CnC, CnD----	0-10	15-35	1.00-1.25	0.6-2.0	0.13-0.21	5.6-7.3	Low----------	0.37	3	3-8
Cazenovia	10-34	28-35	1.20-1.40	0.2-0.6	0.09-0.16	5.6-7.3	Moderate-----	0.37		
	34-60	20-35	1.60-1.85	0.06-0.2	0.11-0.17	6.6-8.4	Low----------	0.28		
CoA, CoB, CoC----	0-11	15-27	1.20-1.50	0.6-2.0	0.14-0.21	5.1-7.3	Low----------	0.49	3	2-5
Collamer	11-25	15-27	1.20-1.50	0.6-2.0	0.14-0.20	5.1-7.3	Low----------	0.49		
	25-47	18-35	1.20-1.50	0.06-0.6	0.16-0.20	5.6-7.8	Low----------	0.49		
	47-80	4-27	1.45-1.65	0.06-0.6	0.12-0.20	6.1-8.4	Low----------	0.64		
ElA, ElB----------	0-10	2-8	1.05-1.30	2.0-6.0	0.14-0.24	4.5-6.5	Low----------	0.24	3	2-6
Elmridge	10-23	2-8	1.35-1.60	2.0-6.0	0.13-0.22	4.5-6.5	Low----------	0.24		
	23-80	35-60	1.55-1.80	<0.2	0.12-0.18	5.6-7.8	Low----------	0.49		
En----------	0-10	2-10	1.20-1.50	2.0-6.0	0.08-0.16	4.5-6.5	Low----------	0.17	4	2-6
Elnora	10-21	2-5	1.20-1.50	6.0-20	0.06-0.08	4.5-6.5	Low----------	0.17		
	21-60	2-5	1.45-1.65	6.0-20	0.03-0.06	5.1-7.3	Low----------	0.17		
FaB, FaC, FaD----	0-8	10-27	1.10-1.40	0.6-2.0	0.11-0.19	5.1-6.5	Low----------	0.32	2	2-6
Farmington	8-16	10-27	1.20-1.50	0.6-2.0	0.07-0.18	5.6-7.8	Low----------	0.32		
	16	---	---	---	---	---	----------	----		

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
FdE*:										
Farmington------	0-8	10-27	1.10-1.40	0.6-2.0	0.11-0.19	5.1-6.5	Low----------	0.32	2	2-6
	8-16	10-27	1.20-1.50	0.6-2.0	0.07-0.18	5.6-7.8	Low----------	0.32		
	16	---	---	---	---	---	----------	----		
Rock outcrop.										
Fn*:										
Fluvaquents.										
Udifluvents.										
Fr----------	0-7	7-20	1.20-1.40	0.6-2.0	0.12-0.20	5.6-7.3	Low----------	0.28	3	3-5
Fredon	7-32	7-20	1.20-1.40	0.2-2.0	0.12-0.20	5.6-7.3	Low----------	0.24		
	32-60	2-10	1.30-1.50	6.0-20	0.02-0.06	6.1-8.4	Low----------	0.10		
GaA, GaB, GaC----	0-9	7-18	1.00-1.30	0.6-2.0	0.17-0.24	5.1-7.3	Low----------	0.32	3	3-8
Georgia	9-32	5-18	1.30-1.60	0.6-2.0	0.09-0.18	5.1-7.3	Low----------	0.32		
	32-60	10-18	1.60-1.80	0.06-0.2	0.08-0.18	5.1-7.3	Low----------	0.32		
Ha----------	0-6	7-25	0.50-1.00	0.6-2.0	0.20-0.30	5.6-7.3	Low----------	0.24	5	10-25
Halsey	6-23	7-25	1.20-1.40	0.6-6.0	0.12-0.18	5.6-7.3	Low----------	0.24		
	23-60	2-10	1.40-1.60	6.0-20	0.02-0.07	6.1-8.4	Low----------	0.10		
HoA, HoB, HoC, HoD----------	0-8	1-10	1.10-1.40	2.0-20	0.05-0.12	4.5-5.5	Low----------	0.17	3-2	2-6
Hoosic	8-15	1-10	1.25-1.55	2.0-20	0.05-0.11	4.5-5.5	Low----------	0.17		
	15-60	0-5	1.45-1.65	>20	0.01-0.05	4.5-6.0	Low----------	0.17		
HpE*:										
Hoosic----------	0-8	1-10	1.10-1.40	2.0-20	0.05-0.12	4.5-5.5	Low----------	0.17	3-2	2-6
	8-15	1-10	1.25-1.55	2.0-20	0.05-0.11	4.5-5.5	Low----------	0.17		
	15-60	0-5	1.45-1.65	>20	0.01-0.05	4.5-6.0	Low----------	0.17		
Blasdell--------	0-10	6-18	1.10-1.40	2.0-6.0	0.10-0.17	4.5-6.0	Low----------	0.28	3	3-6
	10-30	6-18	1.25-1.55	2.0-6.0	0.07-0.11	4.5-6.0	Low----------	0.17		
	30-60	6-18	1.45-1.65	2.0-6.0	0.05-0.09	5.1-6.5	Low----------	0.17		
HvA*, HvB*, HvC*, HvD*, HvE*:										
Hudson---------	0-10	20-40	1.00-1.25	0.2-2.0	0.16-0.21	5.1-7.3	Moderate-----	0.49	3	3-6
	10-15	35-60	1.15-1.40	<0.2	0.13-0.17	5.1-7.3	Moderate-----	0.28		
	15-26	25-60	1.15-1.40	<0.2	0.13-0.17	5.1-7.3	Moderate-----	0.28		
	26-60	35-60	1.15-1.40	<0.2	0.12-0.20	5.1-8.4	Moderate-----	0.28		
Vergennes------	0-12	27-90	1.25-1.55	0.06-0.6	0.11-0.21	4.5-7.3	Moderate-----	0.49	3	2-6
	12-15	60-90	1.10-1.40	<0.2	0.09-0.11	4.5-7.3	Moderate-----	0.49		
	15-29	60-90	1.10-1.40	<0.2	0.09-0.11	5.6-8.4	Moderate-----	0.49		
	29-60	60-90	1.20-1.50	<0.06	0.08-0.10	6.6-8.4	Moderate-----	0.49		
KnA*, KnB*:										
Kingsbury-------	0-11	27-50	1.35-1.55	0.06-0.2	0.12-0.22	5.1-7.8	Moderate-----	0.49	3	3-9
	11-29	60-90	1.40-1.75	<0.06	0.12-0.13	5.1-7.8	High----------	0.28		
	29-60	60-90	1.40-1.50	<0.06	0.12-0.14	7.9-8.4	High----------	0.28		
Rhinebeck-------	0-12	15-40	1.00-1.25	0.2-0.6	0.16-0.21	5.1-7.3	Moderate-----	0.49	3	3-7
	12-29	35-60	1.20-1.40	0.06-0.2	0.12-0.14	5.1-7.8	Moderate-----	0.28		
	29-60	35-60	1.15-1.40	0.06-0.2	0.12-0.14	6.1-8.4	Moderate-----	0.28		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
KrA, KrB, KrC, KrD---------- Knickerbocker	0-12	5-12	1.10-1.40	2.0-6.0	0.11-0.17	4.5-6.0	Low----------	0.20	3	4-6
	12-20	5-12	1.25-1.55	2.0-6.0	0.11-0.17	4.5-6.0	Low----------	0.20		
	20-35	2-8	1.45-1.65	>6.0	0.06-0.08	4.5-6.0	Low----------	0.17		
	35-60	2-8	1.45-1.65	>6.0	0.03-0.08	4.5-6.0	Low----------	0.10		
LaE, LaF---------- Lanesboro	0-4	2-12	1.00-1.20	0.6-2.0	0.13-0.17	4.5-6.0	Low----------	0.24	3	2-5
	4-41	2-12	1.25-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.37		
	41-60	1-12	1.75-1.90	0.06-0.2	0.07-0.16	4.5-6.0	Low----------	0.28		
LmC*: Lanesboro-------	0-4	2-12	1.00-1.20	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.20	3	---
	4-41	2-12	1.25-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.37		
	41-60	1-12	1.75-1.90	0.06-0.2	0.07-0.16	4.5-6.0	Low----------	0.28		
Monarda---------	0-7	10-18	1.00-1.30	0.6-2.0	0.15-0.30	3.6-5.5	Low----------	0.20	3	---
	7-20	10-18	1.30-1.55	0.6-2.0	0.15-0.26	3.6-5.5	Low----------	0.28		
	20-60	10-18	1.70-1.95	<0.2	0.05-0.10	4.5-5.5	Low----------	0.28		
Ln---------- Limerick	0-6	4-10	1.10-1.50	0.6-2.0	0.18-0.30	5.1-7.3	Low----------	0.49	3	2-5
	6-21	2-10	1.10-1.50	0.6-2.0	0.18-0.26	5.6-7.3	Low----------	0.49		
	21-60	1-8	1.20-1.50	0.6-2.0	0.18-0.25	5.6-7.3	Low----------	0.49		
Lo---------- Linlithgo	0-21	18-27	1.15-1.40	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.49	4	2-6
	21-37	18-27	1.35-1.60	0.6-2.0	0.12-0.20	4.5-6.5	Low----------	0.49		
	37-60	0-10	1.50-1.60	2.0-20.0	0.01-0.04	5.6-6.5	Low----------	0.17		
Lt*: Livingston------	0-9	35-90	1.10-1.60	0.2-0.6	0.11-0.23	5.1-7.3	Moderate-----	0.49	3	4-16
	9-37	60-90	1.30-1.65	<0.2	0.09-0.11	5.1-7.8	Moderate-----	0.49		
	37-60	60-90	1.40-1.60	<0.2	0.08-0.10	7.4-8.4	Moderate-----	0.49		
Madalin---------	0-8	25-55	1.00-1.25	0.2-0.6	0.16-0.21	5.1-7.8	Moderate-----	0.37	5	4-10
	8-42	27-60	1.20-1.40	0.06-0.2	0.12-0.13	5.6-7.8	Moderate-----	0.28		
	42-60	40-60	1.15-1.40	<0.2	0.12-0.13	7.4-8.4	Moderate-----	0.28		
MaC*, MbE*: Macomber--------	0-6	10-27	1.10-1.40	0.6-2.0	0.10-0.17	4.5-5.5	Low----------	0.24	3	2-6
	6-22	10-27	1.20-1.50	0.6-2.0	0.04-0.11	4.5-5.5	Low----------	0.24		
	22	---	---	---	---	---	----------	----		
Taconic---------	0-6	10-27	1.10-1.40	0.6-6.0	0.10-0.17	4.5-5.5	Low----------	0.24	2	2-6
	6-14	10-27	1.20-1.50	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.24		
	14	---	---	---	---	---	----------	----		
MnA, MnB, MnC, MnD---------- Manlius	0-6	6-18	1.10-1.40	0.6-2.0	0.10-0.18	3.6-5.5	Low----------	0.28	3	1-5
	6-27	6-18	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low----------	0.20		
	27-34	6-18	1.70-1.95	0.6-2.0	0.03-0.09	4.5-6.5	Low----------	0.20		
	34	---	---	---	---	---	----------	----		
MsA, MsB--------- Massena	0-7	8-22	1.10-1.40	0.6-2.0	0.14-0.20	5.6-7.3	Low----------	0.28	3	3-8
	7-23	7-18	1.20-1.50	0.06-0.6	0.08-0.15	5.6-7.3	Low----------	0.20		
	23-80	7-18	1.70-1.95	0.06-0.6	0.06-0.14	6.6-8.4	Low----------	0.20		
NaB, NbC, NbD, NbE---------- Nassau	0-3	1-10	1.10-1.40	0.6-2.0	0.08-0.16	4.5-5.5	Low----------	0.20	2	3-5
	3-17	1-10	1.20-1.50	0.6-2.0	0.07-0.12	4.5-5.5	Low----------	0.20		
	17	---	---	---	---	---	----------	----		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
NgA, NgB---------	0-8	15-25	1.20-1.50	0.6-2.0	0.17-0.22	5.1-7.3	Low----------	0.49	3	2-6
Niagara	8-23	18-35	1.20-1.50	0.2-0.6	0.16-0.20	5.6-7.8	Low----------	0.49		
	23-60	5-35	1.20-1.50	0.2-0.6	0.12-0.20	6.6-8.4	Low----------	0.64		
Om---------------	0-10	2-18	1.10-1.50	0.6-6.0	0.14-0.22	4.5-6.5	Low----------	0.32	5	2-6
Occum	10-25	2-12	1.20-1.50	0.6-6.0	0.10-0.20	4.5-6.5	Low----------	0.20		
	25-33	2-8	1.20-1.50	0.6-2.0	0.10-0.18	4.5-6.5	Low----------	0.20		
	33-60	0-5	1.30-1.60	>6.0	0.01-0.10	4.5-6.5	Low----------	0.17		
OvA, OvB---------	0-13	15-35	1.00-1.25	0.6-2.0	0.13-0.21	5.6-6.5	Low----------	0.37	3	2-7
Ovid	13-34	28-35	1.20-1.40	0.2-0.6	0.09-0.16	5.6-7.3	Moderate-----	0.37		
	34-80	28-35	1.60-1.80	0.06-0.2	0.11-0.17	7.4-8.4	Low----------	0.28		
Pa---------------	0-20	---	0.25-0.45	0.2-6.0	0.35-0.45	5.1-7.8	----------	----	2	>75
Palms	20-60	7-35	1.45-1.75	0.2-2.0	0.14-0.22	6.1-8.4	Low----------	----		
Pr*, Ps*.										
Pits										
PtB, PtC, PtD----	0-8	2-12	1.00-1.30	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.28	3	2-6
Pittstown	8-21	2-12	1.30-1.60	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.37		
	21-60	2-12	1.70-2.00	0.06-0.6	0.10-0.15	4.5-6.0	Low----------	0.28		
PuA, PuB, PuC----	0-6	1-18	1.10-1.40	0.6-2.0	0.16-0.21	5.6-6.5	Low----------	0.28	3	2-6
Punsit	6-23	1-18	1.30-1.60	0.6-2.0	0.10-0.19	5.6-6.5	Low----------	0.20		
	23-60	1-18	1.70-1.95	0.06-0.2	0.01-0.06	5.6-6.5	Low----------	0.20		
Ra---------------	0-10	3-16	1.20-1.50	0.2-2.0	0.18-0.24	5.1-7.3	Low----------	0.49	5	3-10
Raynham	10-21	3-16	1.20-1.50	0.2-2.0	0.18-0.22	5.1-7.3	Low----------	0.64		
	21-60	3-16	1.20-1.60	0.06-0.2	0.17-0.21	5.6-7.8	Low----------	0.64		
Sa*:										
Saprists.										
Aquents.										
ScA, ScB---------	0-9	2-15	1.20-1.50	0.6-2.0	0.18-0.21	4.5-6.0	Low----------	0.49	3	2-8
Scio	9-31	2-15	1.20-1.50	0.6-2.0	0.17-0.20	4.5-6.0	Low----------	0.64		
	31-80	0-5	1.45-1.65	2.0-20.0	0.02-0.19	5.1-7.8	Low----------	0.17		
Sh---------------	0-10	2-8	1.00-1.25	2.0-6.0	0.14-0.24	5.1-7.3	Low----------	0.24	3	2-10
Shaker	10-22	2-8	1.35-1.60	2.0-6.0	0.13-0.22	5.1-7.3	Low----------	0.24		
	22-80	35-60	1.55-1.80	<0.2	0.12-0.18	5.6-7.8	Low----------	0.49		
StB, StC, StD,										
StE--------------	0-9	5-18	1.00-1.25	0.6-2.0	0.14-0.24	5.1-7.3	Low----------	0.28	3	2-6
Stockbridge	9-29	5-18	1.40-1.65	0.6-2.0	0.12-0.22	5.6-7.3	Low----------	0.37		
	29-60	3-18	1.60-1.85	0.06-0.6	0.07-0.17	5.6-8.4	Low----------	0.24		
SuB*, SuC*, SvD*:										
Stockbridge------	0-9	5-18	1.00-1.25	0.6-2.0	0.14-0.24	5.1-7.3	Low----------	0.28	3	2-6
	9-29	5-18	1.40-1.65	0.6-2.0	0.12-0.22	5.6-7.3	Low----------	0.37		
	29-60	3-18	1.60-1.85	0.06-0.6	0.07-0.17	5.6-8.4	Low----------	0.24		
Farmington------	0-8	10-27	1.10-1.40	0.6-2.0	0.11-0.19	5.1-6.5	Low----------	0.32	2	2-6
	8-16	10-27	1.20-1.50	0.6-2.0	0.07-0.18	5.6-7.8	Low----------	0.32		
	16	---	---	---	---	---	----------	----		
Sw---------------	0-8	5-18	1.10-1.40	0.6-2.0	0.12-0.21	5.1-6.5	Low----------	0.28	5	3-15
Sun	8-25	5-18	1.20-1.50	<0.2	0.08-0.15	5.6-7.3	Low----------	0.20		
	25-60	5-18	1.55-1.75	<0.2	0.06-0.12	6.6-8.4	Low----------	0.20		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
TmF*:										
Taconic	0-6	10-27	1.10-1.40	0.6-6.0	0.10-0.17	4.5-5.5	Low	0.24	2	2-6
	6-14	10-27	1.20-1.50	0.6-6.0	0.04-0.11	4.5-5.5	Low	0.24		
	14	---	---	---	---	---	---	---		
Macomber	0-6	10-27	1.10-1.40	0.6-2.0	0.10-0.17	4.5-5.5	Low	0.24	3	2-6
	6-22	10-27	1.20-1.50	0.6-2.0	0.04-0.11	4.5-5.5	Low	0.24		
	22	---	---	---	---	---	---	---		
Ud*.										
Udipsamments										
Ue*.										
Orthents										
UnA, UnB, UnC,										
UnD	0-9	2-18	1.20-1.50	0.6-2.0	0.18-0.21	4.5-6.0	Low	0.49	3	2-7
Unadilla	9-60	1-18	1.20-1.50	0.6-2.0	0.17-0.20	5.1-7.8	Low	0.64		
UrB*:										
Urban land.										
Hudson	0-10	20-40	1.00-1.25	0.2-2.0	0.16-0.21	5.1-7.3	Moderate	0.49	3	3-6
	10-15	35-60	1.15-1.40	<0.2	0.13-0.17	5.1-7.3	Moderate	0.28		
	15-26	25-60	1.15-1.40	<0.2	0.13-0.17	5.1-7.3	Moderate	0.28		
	26-60	35-60	1.15-1.40	<0.2	0.12-0.20	5.1-8.4	Moderate	0.28		
Vergennes	0-6	27-90	1.25-1.55	0.06-0.6	0.11-0.21	4.5-7.3	Moderate	0.49	3	2-6
	6-16	60-90	1.10-1.40	<0.2	0.09-0.11	4.5-7.3	Moderate	0.49		
	16-29	60-90	1.10-1.40	<0.2	0.09-0.11	5.6-8.4	Moderate	0.49		
	29-60	60-90	1.20-1.50	<0.06	0.08-0.10	6.6-8.4	Moderate	0.49		
Wa	0-11	2-6	1.00-1.25	2.0-6.0	0.10-0.18	4.5-7.3	Low	0.20	3	2-8
Walpole	11-20	2-6	1.30-1.55	2.0-6.0	0.07-0.15	4.5-7.3	Low	0.24		
	20-60	0-2	1.40-1.65	>6.0	0.01-0.10	4.5-7.3	Low	0.10		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Ad---------- Alden	D	None--------	---	---	+1-0.5	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
Au---------- Aurelie	D	None--------	---	---	0-1.0	Perched	Sep-Jun	>60	---	High-----	High-----	Moderate.
BeB, BeC, BeD, BeE---------- Bernardston	C	None--------	---	---	1.5-2.0	Perched	Feb-Apr	>60	---	Moderate	Low------	High.
Bh---------- Birdsall	D	None--------	---	---	+1-1.0	Apparent	Oct-Jul	>60	---	High-----	High-----	High.
BlA, BlB, BlC, BlD---------- Blasdell	A	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
BmA, BmB---------- Blasdell	A	Rare--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
Ca---------- Canandaigua	D	None--------	---	---	+1-1.0	Apparent	Nov-May	>60	---	High-----	High-----	Low.
Cc---------- Carlisle	A/D	None--------	---	---	+.5-1.0	Apparent	Sep-Jun	>60	---	High-----	High-----	Low.
Ce---------- Castile	B	None--------	---	---	1.5-2.0	Apparent	Mar-May	>60	---	High-----	Moderate	Moderate.
CnB, CnC, CnD----- Cazenovia	B	None--------	---	---	2.0-4.0	Perched	Mar-May	>60	---	Moderate	High-----	Low.
CoA, CoB, CoC----- Collamer	C	None--------	---	---	1.5-2.0	Apparent	Mar-May	>60	---	High-----	Moderate	Low.
ElA, ElB---------- Elmridge	C	None--------	---	---	1.5-3.0	Perched	Nov-May	>60	---	High-----	Moderate	Moderate.
En---------- Elnora	B	None--------	---	---	1.5-2.0	Apparent	Feb-May	>60	---	Moderate	Low------	Moderate.
FaB, FaC, FaD----- Farmington	C	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	Moderate.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
FdE*:												
Farmington	C	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	Moderate.
Rock outcrop.												
Fn*:												
Fluvaquents.												
Udifluvents.												
Fr Fredon	C	None	---	---	0-1.5	Apparent	Oct-Jun	>60	---	High	Low	Low.
GaA, GaB, GaC Georgia	C	None	---	---	1.5-3.0	Perched	Nov-May	>60	---	Moderate	Moderate	Moderate.
Ha Halsey	C/D	None	---	---	0-0.5	Apparent	Sep-Jun	>60	---	High	High	Low.
HoA, HoB, HoC, HoD Hoosic	A	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
HpE*:												
Hoosic	A	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
Blasdell	A	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.
HvA*, HvB*, HvC*, HvD*, HvE*:												
Hudson	C	None	---	---	1.5-2.0	Perched	Nov-Apr	>60	---	High	High	Low.
Vergennes	C	None	---	---	1.0-3.0	Apparent	Dec-May	>60	---	Moderate	High	Moderate.
KnA*, KnB*:												
Kingsbury	D	None	---	---	0.5-1.5	Perched	Dec-May	>60	---	High	High	Moderate.
Rhinebeck	D	None	---	---	0.5-1.5	Perched	Jan-May	>60	---	High	High	Low.
KrA, KrB, KrC, KrD Knickerbocker	A	None	---	---	>6.0	---	---	>60	---	Low	Low	Moderate.
LaE, LaF Lanesboro	C	None	---	---	1.5-2.5	Perched	Feb-Apr	>60	---	Moderate	Low	High.
LmC*:												
Lanesboro	C	None	---	---	1.5-2.5	Perched	Feb-Apr	>60	---	Moderate	Low	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
LmC*: Monarda	D	None	---	---	0-1.5	Perched	Oct-May	>60	---	High	High	High.
Ln Limerick	C	Frequent	Brief	Nov-May	0-1.5	Apparent	Nov-Jun	>60	---	High	High	Low.
Lo Linlithgo	B	Occasional	Brief	Nov-May	0.5-1.5	Apparent	Jan-May	>60	---	High	Moderate	Moderate.
Lt*: Livingston	D	None	---	---	0-1.0	Apparent	Sep-Jul	>60	---	High	High	Moderate.
Madalin	D	None	---	---	0-0.5	Apparent	Nov-Jun	>60	---	High	High	Low.
MaC*, MbE*: Macomber	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	Low	High.
Taconic	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	High.
MnA, MnB, MnC, MnD Manlius	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	Low	Moderate.
MsA, MsB Massena	C	None	---	---	0.5-1.5	Apparent	Nov-May	>60	---	High	Moderate	Moderate.
NaB, NbC, NbD, NbE Nassau	C	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	High.
NgA, NgB Niagara	C	None	---	---	0.5-1.5	Apparent	Dec-May	>60	---	High	High	Low.
Om Occum	B	Occasional	Brief	Feb-Apr	4.0-6.0	Apparent	Nov-Apr	>60	---	Moderate	Low	Moderate.
OvA, OvB Ovid	C	None	---	---	0.5-2.0	Perched	Jan-May	>60	---	High	High	Low.
Pa Palms	A/D	None	---	---	+1-1.0	Apparent	Nov-May	>60	---	High	High	Moderate.
Pr*, Ps*. Pits												
PtB, PtC, PtD Pittstown	C	None	---	---	1.5-3.0	Perched	Nov-Apr	>60	---	Moderate	Moderate	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
PuA, PuB, PuC----- Punsit	C	None--------	---	---	0.5-1.5	Perched	Feb-Apr	>60	---	High-----	Moderate	Moderate.
Ra---------- Raynham	C	None--------	---	---	0.5-2.0	Apparent	Nov-May	>60	---	High-----	High-----	Moderate.
Sa*: Saprists.												
Aquents.												
ScA, ScB---------- Scio	B	None--------	---	---	1.5-2.0	Apparent	Mar-May	>60	---	High-----	Moderate	Moderate.
Sh---------- Shaker	C	None--------	---	---	0-1.5	Apparent	Nov-May	>60	---	High-----	Moderate	Moderate.
StB, StC, StD, StE---------- Stockbridge	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
SuB*, SuC*, SvD*: Stockbridge------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Farmington-------	C	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	Moderate.
Sw---------- Sun	D	None--------	---	---	+1-0.5	Apparent	Nov-Apr	>60	---	High-----	High-----	Moderate.
TmF*: Taconic----------	C/D	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
Macomber---------	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	High.
Ud*. Udipsamments												
Ue*. Orthents												
UnA, UnB, UnC, UnD---------- Unadilla	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Low------	Moderate.
UrB*: Urban land.												
Hudson----------	C	None--------	---	---	1.5-2.0	Perched	Nov-Apr	>60	---	High-----	High-----	Low.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
UrB*:												
Vergennes	C	None	---	---	1.0-3.0	Apparent	Dec-May	>60	---	Moderate	High	Moderate.
Wa Walpole	C	None	---	---	0-1.0	Apparent	Nov-May	>60	---	High	Low	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

(Dashes indicate data not available. LL means liquid limit; PI, plasticity index; MD, maximum dry density; OM, optimum moisture; LS, linear shrinkage; and NP, nonplastic)

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution											Moisture density		
			Percentage passing sieve--							Percentage smaller than--						
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm	LL	PI	MD	OM	LS
													Pct		Lb/cu ft	Pct	Pct
Birdsall silt loam 1/ (S82NY-021-013)																	
A---------- 0 to 9	A-1-a(00)	GW-SW	---	88	60	47	30	11	7	---	---	---	NP	NP	93	33	4
Bg1---------- 9 to 13	A-1-a(00)	GW-SW	---	98	87	74	43	17	11	---	---	---	NP	NP	112	22	3
Bg2----------13 to 18	A-2-4(00)	SM	---	---	100	94	69	37	30	13	7	4	3	32	118	18	2
Bg3----------18 to 25	A-4(00)	ML	---	---	100	97	87	76	60	23	12	7	22	20	116	15	2
Cg1----------25 to 35	A-4(00)	ML	---	---	100	100	98	94	61	26	15	9	20	18	117	14	2
Cg2----------35 to 46	A-4(00)	ML	---	---	---	100	99	98	79	26	14	8	22	20	115	15	3
Cg3----------46 to 60	A-4(00)	ML-CL	---	---	---	100	99	97	91	61	42	30	32	23	105	21	4
Blasdell channery silt loam 2/ (S82NY-021-011)																	
Ap---------- 0 to 10	A-2-4(00)	GM	91	79	69	61	52	36	29	15	7	3	33	28	117	12	5
Bw1----------10 to 20	A-4(00)	SM	98	93	86	81	73	53	37	17	9	5	22	20	122	12	4
Bw2----------20 to 30	A-1-a(00)	SM	98	85	72	61	49	19	12	6	4	2	25	22	129	9	5
2C1----------30 to 40	A-1-a(00)	GW-GM	91	63	49	40	30	10	6	3	2	1	30	30	128	10	4
2C2----------40 to 60	A-1-a(00)	GW-GM	95	73	58	46	30	10	7	3	2	1	32	29	128	9	4
Collamer silt loam 3/ (S82NY-021-003)																	
Ap---------- 0 to 11	A-4(05)	ML	---	---	100	100	98	92	88	48	20	20	32	27	101	20	4
Bw1----------12 to 17	A-4(02)	ML	---	---	100	99	96	89	84	48	19	10	25	22	112	15	3
Bw2----------17 to 27	A-4(02)	ML	---	---	---	100	99	95	89	28	12	8	24	21	109	16	3
Bt----------27 to 47	A-4(10)	CL	---	---	---	100	100	98	97	62	28	18	31	21	109	18	7
C----------47 to 60	A-6(10)	CL	---	---	---	100	100	99	98	48	22	14	31	20	106	21	6

See footnotes at end of table.

TABLE 18.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution											Moisture density		
			Percentage passing sieve--							Percentage smaller than--						
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm	LL	PI	MD	OM	LS
													Pct		Lb/cu ft	Pct	Pct
Knickerbocker fine sandy loam 4/ (S82NY-021-001)																	
Ap---------- 0 to 12	A-2-4(00)	SM	---	100	100	99	98	84	30	19	9	4	---	NP	110	16	3
Bw1----------12 to 20	A-2-4(00)	SM	---	100	100	99	97	77	18	12	7	5	---	NP	120	12	---
Bw2----------20 to 35	A-2-4(00)	SM	---	100	100	99	98	82	12	---	---	---	---	NP	118	12	---
C1----------35 to 53	A-3(00)	SP	---	---	100	100	99	77	1	---	---	---	---	NP	105	17	---
C2----------53 to 60	A-3(00)	SP-SM	---	100	100	99	99	88	8	---	---	---	---	NP	109	16	---
Lanesboro channery silt loam 5/ (S82NY-021-006)																	
Ap---------- 0 to 4	A-5(02)	OL	---	97	92	84	77	63	56	36	16	8	42	37	104	18	4
Bw---------- 4 to 17	A-4(00)	ML	---	96	92	84	74	62	54	32	13	7	32	29	114	14	4
Bx----------17 to 41	A-4(00)	SM-SC	100	93	85	76	65	49	38	21	11	6	24	19	129	9	2
C1----------41 to 47	A-4(00)	SM	96	87	79	72	62	48	37	18	9	5	23	19	128	10	3
C2----------47 to 60	A-4(00)	ML-CL	---	97	91	84	76	63	52	28	13	7	22	18	125	11	3
Linlithgo silt loam 6/ (S82NY-021-002																	
Ap---------- 0 to 13	A-4(09)	ML	---	---	100	100	100	99	91	52	26	12	38	30	97	22	7
AB----------13 to 21	A-5(12)	ML	---	---	---	100	100	98	91	56	27	13	44	35	89	27	7
Bw1----------21 to 29	A-4(04)	ML-CL	---	99	98	98	97	93	73	40	21	13	30	24	108	18	5
Bw2----------29 to 37	A-2-4(00)	SM	100	94	88	82	78	62	35	17	9	5	22	18	127	10	3
2C----------36 to 60	A-1-a(00)	GW	100	74	54	40	29	13	5	2	2	1	NP	NP	135	8	2
Manlius channery silt loam 7/ (S82NY-021-010)																	
Ap---------- 0 to 6	A-2-4(00)	SM	100	94	82	65	50	35	28	13	5	2	34	32	118	13	4
Bw---------- 6 to 16	A-4(00)	SM	100	91	83	75	64	48	39	18	9	5	22	20	122	11	2
Bx----------16 to 27	A-1-b(00)	GM	97	69	50	41	32	24	18	7	4	2	19	18	128	10	2

See footnotes at end of table.

TABLE 18.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution												Moisture density		
			Percentage passing sieve--							Percentage smaller than--							
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm	LL	PI	MD	OM	LS
													Pct		Lb/cu	Pct ft	Pct
Macomber channery silt loam 8/ (S82NY-021-016)																	
A---------- 0 to 6	A-2-5(00)	GM	96	82	71	61	48	37	32	19	8	4	41	36	112	16	5
Bw---------- 6 to 22	A-2-4(00)	GM	95	83	75	62	49	37	30	19	9	5	31	28	120	13	4
Monarda silt loam 9/ (S82NY-021-007)																	
Ap---------- 0 to 7	A-5(05)	OL	93	87	12	79	73	64	57	25	6	3	49	40	83	32	2
Bw1---------- 7 to 14	A-5(00)	GM	92	80	72	66	57	48	43	23	7	3	43	43	106	18	3
Bw2----------14 to 20	A-4(00)	SM	100	97	93	87	75	56	45	24	10	5	27	25	121	12	3
C----------20 to 60	A-4(00)	ML-CL	98	92	87	81	72	59	51	34	18	9	29	24	121	13	4
Nassau channery silt loam 10/ (S82NY-021-014)																	
Ap---------- 0 to 3	A-1-b(00)	SM	100	94	82	68	50	33	25	12	5	2	33	30	120	12	4
Bw---------- 3 to 17	A-1-b(00)	SM	97	80	65	56	44	32	25	13	6	3	22	21	124	11	2
Occum loam 11/ (S82NY-021-012)																	
Ap---------- 0 to 10	A-4(02)	ML-CL	---	---	100	100	99	97	66	39	22	14	26	20	111	17	4
Bw1----------10 to 25	A-4(00)	NK	---	---	100	100	99	93	52	27	15	10	22	19	117	14	3
Bw2----------25 to 33	A-2-4(00)	SM	---	100	99	97	93	62	24	11	6	4	NP	NP	120	12	---
C----------33 to 60	A-1-a(00)	GW	---	94	70	48	30	10	3	1	1	---	NP	NP	132	8	---
Taconic channery silt loam 12/ (S82NY-021-015)																	
A---------- 0 to 6	A-2-5(00)	GM	100	82	72	61	51	40	35	20	8	3	43	40	109	16	4
Bw---------- 6 to 14	A-1-b(00)	GM	87	65	55	47	38	29	24	15	8	3	34	32	118	14	4

See footnotes at end of table.

TABLE 18.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution										LL	PI	Moisture density		LS
			Percentage passing sieve--							Percentage smaller than--							
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			MD	OM	
													Pct		Lb/cu ft	Pct	Pct
Vergennes silty clay loam 13/ (S82NY-021-012)																	
Ap---------- 0 to 9	A-4(10)	ML	---	---	---	100	100	97	91	66	47	26	37	29	96	24	4
E---------- 9 to 12	A-4(09)	ML	---	---	---	100	100	97	90	66	49	27	36	27	98	23	6
Bt----------15 to 26	A-7-5(22)	MH	---	---	---	---	100	100	99	84	72	52	51	35	96	26	8
BC----------26 to 29	A-7-6(22)	ML-CL	---	---	---	---	100	100	99	83	69	46	47	28	96	26	9
C----------29 to 60	A-7-5(18)	ML	---	---	---	100	99	99	98	82	63	37	45	30	96	26	8

1/ Location: Town of Ghent; 600 feet west of NY Route 9H, 4,900 feet south of the intersection of Route 9H and Rabbit Lane.

2/ Location: Town of Ghent; 100 feet east of County Route 9 and 1,100 feet south of the intersection of County Route 9 and Tice Hill Road.

3/ Location: Town of Livingston; 200 feet west of Walkers Mills Road and 1,320 feet north of its intersection with Wire Road.

4/ Location: Town of Stuyvesant, 144 feet south of Sunnyside Road and 441 feet west of the powerline.

5/ Location: Town of Hillsdale; 20 feet west of Spring Brook Road and 0.5 mile southeast of its intersection with Overlook Drive.

6/ Location: Town of Claverack; 2,000 feet west of the intersection of Spook Rock Road and Stone Mill Road.

7/ Location: Town of Hillsdale; 20 feet west of Spring Brook Road and 0.5 mile southeast of its intersection with Overlook Drive.

8/ Location: Town of Hillsdale; 500 feet east of Lockwood Road and 0.25 mile south of its intersection with West End Road.

9/ Location: Town of Hillsdale; 300 feet northwest of NY Route 22 and 1 mile north of the intersection of Route 22 and County Route 7D.

10/ Location: Town of Chatham; 600 feet west of Reed Road and 0.3 mile south of the intersection of Reed Road and Richmond Road.

11/ Location: Town of Greenport; 660 feet east of Spook Rock Road and 660 feet north of its intersection with Hiscox Road.

12/ Location: Town of Hillsdale; 500 feet east of Lockwood Road and 0.25 mile south of its intersection with West End Road.

13/ Location: Town of Stuyvesant; 2,500 feet west of the intersection of Hollow Road and Eichybush Road, 200 feet south of Hollow Road.

TABLE 19.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Alden	Fine-loamy, mixed, nonacid, mesic Mollic Haplaquepts
Aquents	Aquents
Aurelie	Fine-loamy, mixed, nonacid, frigid Aeric Haplaquepts
Bernardston	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Birdsall	Coarse-silty, mixed, nonacid, mesic Typic Humaquepts
Blasdell	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Canandaigua	Fine-silty, mixed, nonacid, mesic Mollic Haplaquepts
Carlisle	Euic, mesic Typic Medisaprists
Castile	Loamy-skeletal, mixed, mesic Aquic Dystrochrepts
Cazenovia	Fine-loamy, mixed, mesic Glossoboric Hapludalfs
Collamer	Fine-silty, mixed, mesic Glossaquic Hapludalfs
Elmridge	Coarse-loamy over clayey, mixed, mesic Aquic Dystric Eutrochrepts
Elnora	Mixed, mesic Aquic Udipsamments
Farmington	Loamy, mixed, mesic Lithic Eutrochrepts
Fluvaquents	Fluvaquents
Fredon	Coarse-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic Aeric Haplaquepts
Georgia	Coarse-loamy, mixed, mesic Aquic Dystric Eutrochrepts
Halsey	Coarse-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic Mollic Haplaquepts
Hoosic	Sandy-skeletal, mixed, mesic Typic Dystrochrepts
Hudson	Fine, illitic, mesic Glossaquic Hapludalfs
Kingsbury	Very fine, illitic, mesic Aeric Ochraqualfs
Knickerbocker	Sandy, mixed, mesic Typic Dystrochrepts
*Lanesboro	Coarse-loamy, mixed, frigid Typic Dystrochrepts
Limerick	Coarse-silty, mixed, nonacid, mesic Typic Fluvaquents
Linlithgo	Fine-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic Aeric Fluvaquents
Livingston	Very fine, illitic, nonacid, mesic Mollic Haplaquepts
Macomber	Loamy-skeletal, mixed, frigid Typic Dystrochrepts
Madalin	Fine, illitic, mesic Mollic Ochraqualfs
Manlius	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Massena	Coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts
Monarda	Coarse-loamy, mixed, nonacid, frigid Aeric Haplaquepts
Nassau	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
Niagara	Fine-silty, mixed, mesic Aeric Ochraqualfs
Occum	Coarse-loamy, mixed, mesic Fluventic Dystrochrepts
Ovid	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Palms	Loamy, mixed, euic, mesic Terric Medisaprists
Pittstown	Coarse-loamy, mixed, mesic Aquic Dystrochrepts
Punsit	Coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts
Raynham	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts
Rhinebeck	Fine, illitic, mesic Aeric Ochraqualfs
Saprists	Saprists
Scio	Coarse-silty, mixed, mesic Aquic Dystrochrepts
Shaker	Coarse-loamy over clayey, mixed, nonacid, mesic Aeric Haplaquepts
Stockbridge	Coarse-loamy, mixed, mesic Dystric Eutrochrepts
Sun	Coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts
Taconic	Loamy-skeletal, mixed, frigid Lithic Dystrochrepts
Udifluvents	Udifluvents
Udipsamments	Udipsamments
Udorthents	Udorthents
Unadilla	Coarse-silty, mixed, mesic Typic Dystrochrepts
Vergennes	Very fine, illitic, mesic Glossaquic Hapludalfs
Walpole	Sandy, mixed, mesic Aeric Haplaquepts

TABLE 20.--RELATIONSHIPS BETWEEN SOIL SERIES AND THEIR POSITION, PARENT MATERIAL, AND DRAINAGE

Parent material and soil characteristics	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
SOILS ON OUTWASH TERRACES, PLAINS, AND ALLUVIAL FANS IN VALLEYS							
Very deep, moderately coarse textured and coarse textured, soils formed in gravelly brownish material over outwash (sand and gravel)		Hoosic		Castile	Fredon	Fredon	Halsey
Very deep, medium textured soils formed in gravelly, brownish material over gravel			Blasdell				
Very deep, moderately coarse textured soils formed in brownish material over sand		Knickerbocker			Walpole	Walpole	
SOILS ON LACUSTRINE PLAINS							
Very deep, fine textured soils formed in brownish, lacustrine material with an accumulation of clay in the subsoil				Hudson	Rhinebeck		Madalin
Very deep, moderately fine and medium textured soils formed in brownish lacustrine material with more than 18 percent clay in the subsoil				Collamer	Niagara	Canandaigua	Canandaigua
Very deep, medium textured soils formed in brownish lacustrine material with less than 18 percent clay in the subsoil			Unadilla	Scio		Rayham	Birdsall
Very deep, medium textured soils formed in brownish lacustrine material over clay				Elmridge	Shaker		
SOILS ON UPLAND TILL PLAINS							
Very deep, very fine textured soils formed in brownish lacustrine sediments, with an accumulation of clay in the subsoil				Vergennes	Kingsbury		Livingston

TABLE 20.--RELATIONSHIPS BETWEEN SOIL SERIES AND THEIR POSITION, PARENT MATERIAL, AND DRAINAGE--Continued

Parent material and soil characteristics	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
	SOILS ON UPLAND TILL PLAINS						
Very deep, medium textured soils formed in brownish glacial till with firm substratum			Bernardston	Pittstown	Punsit		Alden
Very deep, medium textured soils formed in brownish glacial till, non-acid			Stockbridge	Georgia	Massena	Massena Sun	Sun
Very deep, medium textured soils formed in reddish glacial till			Cazenovia	Cazenovia	Ovid		
Shallow, medium textured soils formed in brownish glacial till over shale bedrock		Nassau					
Moderately deep, medium textured soils formed in brownish glacial till over shale bedrock	Manlius	Manlius	Manlius				
Shallow, medium textured soils formed in brownish glacial till over limestone bedrock		Farmington	Farmington				
Very deep, medium textured soils formed in brownish glacial till with dense substratum, with a mean annual soil temperature of less than 45 degrees F			Lanesboro			Monarda Aurelie	
Moderately deep, medium textured soils formed in brownish glacial till over slate or phyllite bedrock, with a mean annual soil temperature of less than 45 degrees F			Macomber				
Shallow, medium textured soils formed in brownish glacial till over slate or phyllite bedrock, with a mean annual soil temperature of less than 45 degrees F		Taconic					

TABLE 20.--RELATIONSHIPS BETWEEN SOIL SERIES AND THEIR POSITION, PARENT MATERIAL, AND DRAINAGE--Continued

Parent material and soil characteristics	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
	SOILS ON FLOOD PLAINS IN VALLEYS						
Very deep, medium textured soils formed in brownish alluvial sediments over sand and gravel			Occum		Linlithgo		
Very deep, medium textured soils formed in brownish alluvial sediments						Limerick	
Very deep, coarse textured to moderately fine textured brownish alluvial sediments	Udifluvents	Udifluvents	Udifluvents	Udifluvents	Fluvaquents	Fluvaquents	Fluvaquents
	SOILS IN SWAMPS AND BOGS						
Very deep soils formed in well decomposed organic material more than 51 inches thick							Carlisle
Very deep soils formed in well decomposed, organic material 16 to 51 inches thick over medium textured material							Palms
Very deep soils formed in well decomposed, organic material more than 16 inches thick							Saprists
Very deep soils formed in medium textured grayish mineral material							Aquents
	VARIABLE SOILS ON TILL PLAINS, OUTWASH TERRACES, AND LACUSTRINE PLAINS						
Very deep soils formed in medium textured mixed soil material	Udorthents	Udorthents	Udorthents				
Very deep soils formed in coarse textured dredged soil material	Udipsamments	Udipsamments	Udipsamments				

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